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Dollarization in Canada: The Buck Stops There

by John Murray and James Powell

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John Murray and James Powell

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The views expressed in this report are solely those of the authors. No responsibility for them should be attributed to the Bank of Canada.

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Abstract

The sharp depreciation of the Canadian dollar and the successful launch of the euro have spawned an animated debate in Canada concerning the potential benefits of formally adopting the U.S. dollar as our national currency. Some observers have suggested that this debate is largely irrelevant, since the Canadian economy is already highly "dollarized." Canadian businesses and households, they assert, often use the U.S. dollar to perform standard money functions in preference to their own currency. Very little evidence has been advanced, however, to support these claims.

The authors of this report examine the available data in an effort to overcome this informational deficiency and to draw some tentative conclusions about the extent to which Canada has already been informally dollarized. The evidence that they present suggests that many of the concerns (or hopes) that have been expressed about the imminent dollarization of the Canadian economy are misplaced. The Canadian dollar continues to be used as the principal unit of account, medium of exchange, and store of value within our borders, and there is no indication that dollarization is likely to take hold in the foreseeable future.

JEL classification: F36, E32, F33
Bank classification: Exchange rate regimes

Résumé

La dépréciation marquée du dollar canadien et le lancement réussi de l'euro ont déclenché un débat animé quant aux avantages que procurerait l'adoption du dollar américain comme monnaie officielle au Canada. Certains observateurs estiment que ce type de débat est oiseux, puisque l'économie canadienne serait déjà fortement « dollarisée ». Les entreprises et les ménages canadiens, soutiennent-ils, utilisent souvent le billet vert, de préférence à leur propre devise nationale, pour combler leurs besoins liés aux fonctions types de la monnaie. Très peu d'études viennent toutefois appuyer cette thèse.

Afin de pallier le manque d'information sur le sujet, les auteurs de ce rapport examinent les données disponibles et tirent des conclusions provisoires concernant le degré de dollarisation qui s'opère déjà au Canada. Selon leurs observations, beaucoup des préoccupations (et des espoirs) exprimées à l'égard d'une dollarisation imminente de l'économie canadienne sont dépourvues de fondement. Le dollar canadien demeure le principal instrument utilisé comme unité de compte, moyen d'échange et réserve de valeur à l'intérieur de nos frontières, et rien ne permet de croire que la dollarisation est susceptible de s'intensifier dans un avenir prévisible.

Classification JEL : F36, E32, F33
Classification de la Banque : Régimes de taux de change

1. Introduction

The sharp depreciation of the Canadian dollar and the successful launch of the euro have spawned an animated debate among academics and policy-makers in Canada concerning the potential benefits of "dollarization"—generally defined as the widespread use of another country's currency to perform standard monetary functions. Several proposals, ranging from unilateral adoption of the U.S. dollar to a full-blown monetary union, have been put forward and received varying degrees of support from Canadian politicians and the general public.

Some observers have suggested that any decision made at an official level, either for or against such an initiative, will be largely irrelevant, since dollarization is already proceeding through less formal channels.[1] They argue that the highly integrated Canadian and U.S. economies, coupled with Canada's growing dependence on its southern neighbour, have set in train a process whereby Canadians are being inexorably drawn towards the U.S. dollar. With or without the agreement of policy-makers, therefore, market forces will eventually ensure that the U.S. dollar becomes our preferred unit of account, medium of exchange, and store of value.

The purpose of this report is *not* to review the advantages or disadvantages of adopting the U.S. dollar as our national currency, but rather to examine the available data and determine the extent to which Canada has already been informally dollarized. Section 2 discusses the various forms that dollarization can take and the alternative ways it has been defined in the literature. Section 3 reviews the experience of Argentina during the past 10 years and describes what a truly dollarized economy looks like. Section 4 reviews some of the factors that might either encourage or discourage dollarization in Canada. Sections 5 to 7 take each money function in turn (unit of account, medium of exchange, and store of value) and document the degree to which dollarization has taken hold in Canada. Section 8 summarizes our results and assesses the policy challenges that dollarization might pose in the future.

Although our evidence is fragmentary, existing data suggest that informal dollarization is proceeding at a very slow (to non-existent) pace. Indeed, by many measures, Canada is less dollarized now than it was 20 years ago and bears little resemblance to those economies that are typically regarded as being truly dollarized. Some Canadian companies maintain their financial

1. For example,
"The most prevalent argument in favour of 'dollarization' . . . is that we're already highly dollarized." *The National Post* (*Saturday Night Magazine*), 5 May 2001
". . . c'est de reconnaître le fait suivant: que le processus de dollarisation *de facto* est lui bel et bien amorcé, qu'il est très avancé et qu'il se poursuivra." *Le Devoir*, 4 décembre 2001
". . . Canada, by osmosis, has already adopted the U.S. dollar." *The Globe and Mail*, 26 January 2002

statements in both Canadian and U.S. dollars, and roughly 9 per cent of the deposits held at Canadian banks are now denominated in U.S. dollars. Canadians also appear to be holding an increasing proportion of their financial wealth in U.S.-dollar assets. It would be a mistake to interpret this as evidence of dollarization, however, in the sense of domestic economic activity being conducted increasingly in U.S. dollars. The assets that Canadians hold in foreign currencies are used, for the most part, to support business activities abroad and to achieve a more efficient allocation of wealth. In other words, globalization and diversification should not be confused with dollarization.

Most, if not all, domestic transactions in Canada are still conducted with the Canadian dollar. While globalization may eventually push Canada to a point where the benefits of operating under a common currency outweigh the advantages of a separate national currency, this "tipping point" does not appear to be imminent. Some observers like to assert that the end is near, but the changes we have witnessed so far are less revolutionary than these would-be visionaries suggest. To paraphrase Mark Twain: reports of the impending death of the Canadian dollar are greatly exaggerated.

2. The Various Forms that Dollarization Can Take

Dollarization is a generic term used to characterize any currency that effectively serves as a replacement for the national currency—the substitute currency need not be the U.S. dollar. It is typically the currency of a major trading partner or an important industrial power with a reputation for sound monetary policy. In the case of Canada, of course, dollarization would mean the use of the U.S. dollar.

Dollarization can occur either officially or through a market-based process, in which individual consumers and businesses shift to another currency. Most countries that have opted for *official* dollarization are extremely small and open, relying on a single good or service (such as tourism) for much of their income and importing most of what they consume. In addition, they have often had a colonial connection with the country whose currency they use, or they exist as a dependency of a larger industrialized economy. Prior to the recent move by Ecuador to dollarize its economy, the largest country to officially use another country's currency was Panama, whose population is currently less than 3 million. The U.S. Congress Joint Economic Committee (2000) has identified 29 countries (or separate economic entities) that are currently members of an official common-currency regime.

For many of these "countries," the choice of currency was a matter of history and long-standing political affiliation. No explicit decision was made to adopt the mother country's money; they simply stayed with the currency that they had always used. The choice was not necessarily a bad one, and it may have represented the most efficient outcome from their perspective. Many of these countries are too small and open to effectively operate under a floating exchange rate or to establish the sort of institutional infrastructure necessary to issue their own money. So much of their output is concentrated in a single exported good or service that the money illusion necessary to sustain a floating exchange rate would not be present (McKinnon 1963). Prices would invariably be quoted in the currency of their major trading partner, and it would not be efficient or feasible to maintain a separate national currency for most domestic transactions.[2]

Countries that have experienced *unofficial* or market-based dollarization are often larger than those that have officially dollarized, but the situation is not as common as some might assume. Baliño, Bennett, and Borensztein (1999) identify only 18 countries that fall into this category. Unofficial dollarization has usually been preceded by an extended period of high inflation and reckless macroeconomic policy. Failed currency reforms, onerous capital controls, the arbitrary confiscation of wealth, and the absence of defined property rights are also common in these countries. Years of fiscal and monetary policy mismanagement have eroded investor confidence and forced citizens to look for an alternative monetary instrument. What is surprising, in most instances, is how serious and protracted the economic mismanagement must be before a majority of citizens are prepared to abandon their domestic currency. It is unclear whether this is due to nationalism, habit, or significant network externalities. In any event, policy-makers must go to some lengths before they risk losing their national currencies. Unofficial dollarization, it seems, is not as easy as some suggest. But once it has happened, the process is almost impossible to reverse, except through involuntary means.

It is important not to confuse dollarization with globalization. The dramatic growth in world trade and investment in recent years has led to a sharp increase in the number of transactions that businesses and households have with foreigners. This, in turn, has led to a natural increase in the demand for foreign currency—even among the largest and most well-managed economies. One might argue that globalization is making countries much smaller and that they will soon resemble the microeconomies described above. It will be some time, however, before the level of foreign activity in most industrial countries reaches the point where they have little choice but to adopt a

2. Interestingly, many of these countries have a national currency that manages to coexist with the foreign currency. Its use, however, is limited to very small transactions, such as buying a newspaper or other convenience good.

common currency. In the meantime, most domestic transactions will continue to be conducted in the national currency.

It is also important not to confuse dollarization with diversification. The fact that investors have started to hold a much larger share of their financial wealth in foreign assets is not necessarily a sign of dissatisfaction with their domestic currencies or a sign of capital flight. Market liberalization and a greater appreciation of the gains that can be realized through international diversification have resulted in a dramatic increase in gross capital flows into and out of countries. Investors in previous periods suffered from an evident home-country bias and are only now beginning to achieve a more efficient trade-off between risk and return. The excessive concentration in home-country assets in earlier periods has been highlighted in recent work by Tesar and Werner (1992). If foreign goods and services account for 25 to 30 per cent of what the typical household consumes, as is currently the case in Canada, a similar proportion of its wealth should probably be invested in foreign assets simply for hedging purposes. When one recognizes that most of an individual's wealth is held in the form of human capital and domestic real estate, the proportion of financial wealth that ought to be held in foreign assets could easily approach 100 per cent. In other words, the typical household in most industrial countries is still some distance from the efficient frontier suggested by a simple capital-asset pricing model.

3. Argentina—The Archetypal Dollarized Economy

Argentina's experience over the post-war period is instructive, not only because it was perhaps the best-known example of a dollarized economy, but because its performance and general characteristics were so similar to those of Canada over the first half of the twentieth century. In 1900, Argentina was one of the richest countries in the world. Its per capita income was comparable with that of Canada, and it remained so until 1940. Both countries established central banks in the midst of the Great Depression and relied on exports of primary products for a large portion of their gross domestic product (GDP).

After the Second World War, the two countries' paths diverged dramatically. Growth in Canada was relatively strong and steady, while Argentina's was weak and erratic. Over the next 50 years, domestic prices in Canada rose by a factor of 10, while Argentina's jumped by more than 10 to the twelfth power. Porter and Judson (1996) have described Argentina's experience through much of this period as one of high chronic inflation, punctuated with occasional bouts of hyperinflation. Four separate currency reforms were introduced over a six-year period, beginning with the Austral Plan in 1985 and ending with the Convertibility Program in 1991.[3] The pattern was

3. Recent events in Argentina have necessitated yet another currency reform.

always the same: early promises of fiscal tightening, followed by populist spending programs that were financed by printing money.

In July 1989, the monthly inflation rate in Argentina hit an all-time high of 198 per cent. A new program was announced but soon collapsed, and in January 1990 the government froze all bank deposits and converted them into discounted 10-year bonds called Bonex and denominated in U.S. dollars. A combination of hyperinflation, sharp currency depreciations, and arbitrary confiscation of wealth had effectively undermined all confidence in the government.

Finally, having exhausted all other avenues, the government decided that the only way to restore economic stability and its own credibility was to establish a currency board. In March 1991, the government announced the Convertibility Program. The peso was tied to the U.S. dollar at parity and was made convertible into U.S. dollars on demand. Although domestic inflation soon dropped to single digits, and eventually turned negative, the damage inflicted on the Argentine financial system during the previous 10 to 20 years was not so easily reversed. Argentine citizens had learned from bitter experience not to trust either their domestic currency or their domestic financial institutions. Households and businesses continued to switch out of peso-denominated deposits and into dollars. Although some of these deposits remained within the banking system, as U.S.-dollar deposits, most were converted directly into U.S. currency and hoarded. Bank deposits were no longer regarded as a reliable store of value, independent of the currency in which they were denominated.

Federal Reserve data suggest that, from 1986 to 1991, more than one-third of the $100 billion that left the United States in the form of U.S. dollar bills was destined for Argentina (Porter and Judson 1996). Taken at face value, the figures indicate that, on average, each man and woman in Argentina held more than US$1000 in currency—more than the entire outstanding stock of peso currency and the broad money aggregate M3. Some of this money may have found its way to other countries, and a significant portion may have been used to finance the South American drug trade. Nevertheless, the amounts involved are too large to be credited to only these factors.

By the end of 1999, a large share of the Argentine money supply had been unofficially dollarized and was held outside the banking system. Moreover, approximately 60 per cent of all deposits that remained within the banking system were denominated in U.S. dollars. This figure continued to climb, however, and by December 2001, when the Convertibility Program was finally suspended, more than 70 per cent of deposits were in U.S. dollars.

Throughout this period, the U.S. dollar was used not just as a store of value, but also as a medium of exchange and a unit of account. Expensive consumer durables and real estate were typically

priced and purchased in U.S. dollars, and most savings were held in dollar-denominated assets. The peso continued to circulate and was initially used for most other transactions. By the end of the Convertibility Program, however, its importance had greatly diminished. In the chaos surrounding the most recent crisis, citizens have been forced to resort to crude methods of barter exchange, owing to a currency shortage.

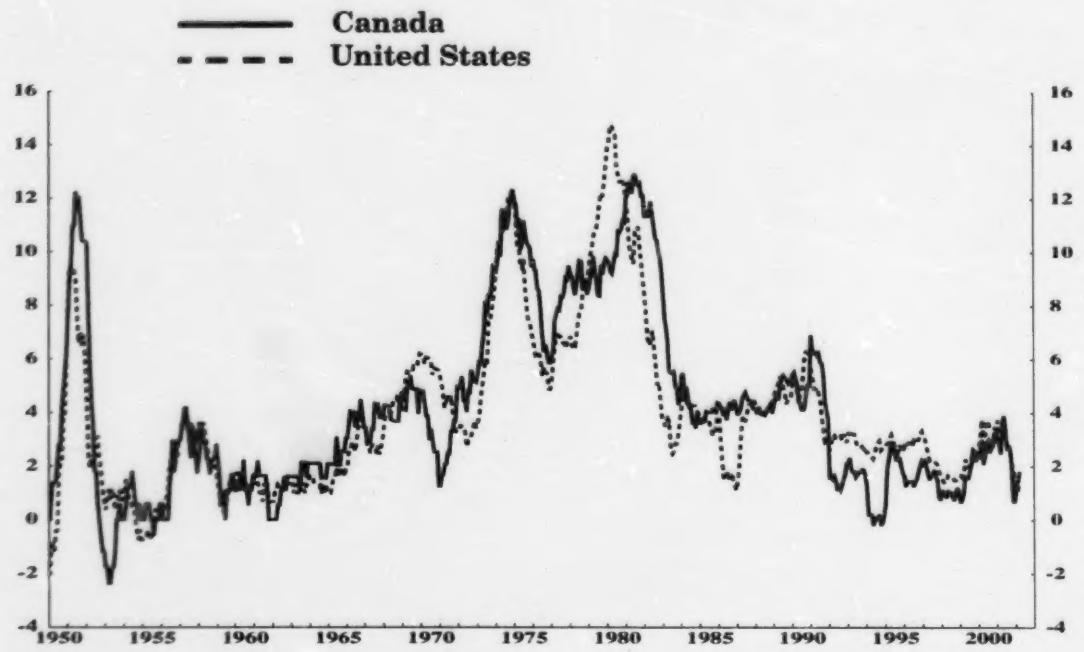
4. The Evidence for Canada

Argentina obviously represents an extreme example, but it is nevertheless a useful benchmark against which to judge Canada's recent experience. The International Monetary Fund (IMF) regards any country that has more than 30 per cent of its broad money aggregates denominated in a foreign currency as being dollarized (Baliño, Bennett, and Borensztein 1999). As subsequent figures will show, Canada is still some distance from this relatively modest hurdle.[4] Before examining the data, however, it is useful to review some of the factors that might either encourage or discourage dollarization in Canada.

Unlike Argentina, Canada has an inflation history that is broadly similar to that of most other industrial countries. While the 1970s and 1980s were marked by occasional episodes of inflation in the low double digits, this experience was shared by many other G-10 countries, including the United States. Indeed, over the past 50 years, the year-by-year movements in the Canadian and U.S. consumer price indexes (CPIs) have been strikingly similar—even though Canada has operated under a floating exchange rate for most of this period (Figure 1). The cumulative difference in their price levels from 1950 to 2001 was less than 7 per cent. The desire to move to a more reliable monetary regime would not provide a very convincing reason, therefore, for Canadians to shift to the U.S. dollar. An additional point is that Canada's inflation rate has been slightly lower than that of the United States in each of the past 10 years, and is now tied to a system of explicit inflation targets.

4. Some researchers favour a higher benchmark, arguing that a country should not be regarded as being dollarized unless more than 50 per cent of its broad money stock is denominated in a foreign currency.

Figure 1: CPI Inflation Rates
(year-over-year percentage change)



Unlike the microeconomies that have officially dollarized, Canada is a major industrial power. It has the eighth-largest GDP in the world (measured according to the purchasing-power-parity value of its exchange rate), and the 34th-largest population. Canadians are used to thinking of their economy as small and open, but judged on an international scale, it is neither small nor very open. While exports and imports account for close to 80 per cent of GDP, much of this represents transborder shipments of raw materials, parts, and intermediate products, which receive some additional processing in Canada and are then sent back to the original country. Government activities and other non-tradeable goods and services currently account for more than 65 per cent of Canada's final output.

Two factors that might favour dollarization, at least when compared with the situation in Europe prior to the introduction of Economic and Monetary Union, are (i) Canada's proximity to the wealthiest country in the world and (ii) the large percentage of Canada's trade that is conducted with this single trading partner. From this perspective, dollarization becomes a more legitimate subject of debate. If 12 relatively disparate and occasionally fractious countries in Europe can form a monetary union, why shouldn't Canada and the United States? The issue that we are addressing, however, is not whether Canada and United States *should* officially dollarize, but

whether it is already happening by unofficial means.[5] Here there is reason to be a little more skeptical.

Sections 5 to 7 will examine the available evidence, with a view to determining whether this process is occurring. Although the data are not complete or comprehensive, the picture that emerges is one of globalization and diversification rather than dollarization. Canada's strong commercial ties with the United States have led to an increased demand for U.S. dollars and have encouraged a number of Canadian firms to keep their accounts in both Canadian and U.S. dollars. It is not obvious, however, that these practices reflect true dollarization. Nor are they significant enough to lead to the wholesale adoption of the U.S. dollar by the rest of the economy.

5. The U.S. Dollar as a Unit of Account

Very little information is available on the extent to which Canadian businesses and households use the U.S. dollar as a unit of account. While this may be a testament to how uncommon the practice is, there is reason to believe that some Canadian firms regularly price their products and keep their accounts in U.S. dollars. For the most part, however, one would expect this to be restricted to export sales and firms with extensive operations outside the country.

5.1 Consumer products and salaries

Casual observation suggests that goods and services purchased by Canadian households from firms operating within Canada are seldom, if ever, priced in U.S. dollars. The only exceptions that we are aware of involve tourist services, such as hotels, amusement parks, and other entertainment activities, where a large share of the customer base comes from outside the country. In these cases, both Canadian and U.S. prices are often quoted.

Similarly, few Canadians have their salaries and wages denominated in U.S. dollars, or in any other currency, except the Canadian dollar. Some professional athletes and business executives may be paid in U.S. dollars, but this, once again, is a reflection of the international market in which their services are sold and the time that they spend working outside the country. It is not dollarization in the Argentine sense, where domestic salaries and many household purchases are regularly quoted in another country's currency.

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5. The advantages and disadvantages of moving to an alternative exchange rate system have been examined in other papers. See, for example, Murray (1999) and Murray, Schembri, and St-Amant (2001).

5.2 Intra- and interbusiness pricing

It would not be surprising if most of the exports that Canadian firms sold to foreign customers, as well as the commodities that they purchased from foreign firms, were priced in U.S. dollars. The U.S. dollar is the dominant currency in world markets and is regularly used for invoicing products, even when neither party to the transaction is located in the United States.

Krugman (1984), Black (1990), and others observe the following patterns in international invoicing.[6] First, the currency of the exporting country is typically used *unless* the importing country is much larger than the exporting country. Second, sales involving homogeneous primary commodities, such as oil, minerals, and forest products, are almost always priced in U.S. dollars. These practices, coupled with the dominant role that the U.S. dollar plays more generally, suggest that Canadian exports and imports would rarely be priced in Canadian dollars. This would not be evidence of any new trend towards dollarization, however, or a new-found preference for U.S. dollars, but simply the continuation of a practice that has existed since the U.S. dollar replaced the pound sterling as the principal international currency.

Information on the pricing practices used in business-to-business sales within Canada would be most relevant for our study. If there were signs that Canadian businesses were beginning to price in U.S. dollars for sales to other Canadian firms, this would clearly be evidence of creeping dollarization. Care must be exercised, however, in interpreting any anecdotal evidence that indicates that this is happening. First, one might expect sales between branches of the same firm operating on both sides of the Canadian–U.S. border to be invoiced in U.S. dollars. Second, as noted earlier, sales involving primary products might also be priced in U.S. dollars, based on long-standing industry practices.

5.3 Survey results

To better determine what is actually happening in Canada, a survey was recently conducted by the staff in the Bank of Canada's regional offices. In March and April 2002, 100 firms were surveyed on whether (and under what circumstances) they priced their products and kept financial records in a currency other than the Canadian dollar. Although the sample was relatively small, the staff tried to ensure that it reflected the industrial composition and regional distribution of firms within the economy. (Additional surveys will be run in coming months and will include 300 more firms.) The results of this initial survey are reported below.

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6. Several studies have shown that even large countries, such as Japan, have a tendency to invoice their exports in U.S. dollars, whether or not the foreign customer is American.

Q. 1 Do you quote prices to Canadian customers in Canadian dollars, U.S. dollars, or both?

As expected, pricing in U.S. dollars for purely domestic sales is rare. Only 6 per cent of the reporting firms quoted prices exclusively in U.S. dollars (Table 1). An additional 17 per cent quoted prices in both Canadian and U.S. dollars. These firms, however, also tended to export a large part of their production or to produce raw materials, whose prices are set on U.S.-based markets (such as the New York Mercantile Exchange and Chicago Mercantile Exchange) and are traditionally priced in U.S. dollars. Some firms indicated that they priced in both currencies for convenience, using the same price list for domestic and foreign customers. Others noted that they did so in response to demands from other Canadian companies that are part of a U.S. supply chain or that have extensive international operations. In many instances, however, the Canadian-dollar price was still used as the base (or true unit of account) on which the U.S.-dollar price was calculated.

Table 1: Denomination of Domestic Prices

	Per cent of total responses (absolute number)		
	Can$	**US$**	**Both**
Canada	77 (76)	6 (6)	17 (17)
Atlantic Canada	94 (15)	0 (0)	6 (1)
Quebec	62 (13)	10 (2)	28 (6)
Ontario	84 (21)	8 (2)	8 (2)
Prairies	89 (17)	0 (0)	11 (2)
British Columbia	56 (10)	11 (2)	33 (6)

Q. 2 Do you quote prices to foreign customers in Canadian dollars, U.S. dollars, the local currency, or some combination of currencies?

As Table 2 shows, 53 per cent of the firms surveyed indicated that they price their foreign sales in U.S. dollars, with another 7 per cent using a different local currency. These figures were somewhat smaller than had been expected, given the earlier empirical evidence cited by Krugman

(1984) and the strong economic ties linking the Canadian and U.S. economies. Surprisingly, only 20 per cent of the foreign sales originating from firms in Ontario were priced in U.S. dollars.

Table 2: Denomination of Foreign Prices

	Per cent of total responses (absolute number)			
	Can$	**US$**	**Local**	**Combination**
Canada	23 (19)	53 (43)	7 (6)	17 (14)
Atlantic Canada	0 (0)	84 (10)	8 (1)	8 (1)
Quebec	20 (3)	70 (14)	0 (0)	10 (3)
Ontario	45 (9)	20 (4)	25 (5)	10 (2)
Prairies	15 (2)	62 (8)	0 (0)	23 (3)
British Columbia	29 (5)	42 (7)	0 (0)	29 (5)

Q. 3 Are your financial statements quoted in Canadian dollars, U.S. dollars, or both currencies?

Over 80 per cent of the firms that were interviewed prepare their financial statements in Canadian dollars (Table 3). Some of them noted that, since they are obliged to use Canadian dollars for domestic taxes and/or regulators, this is the most efficient alternative. Firms that prepare their statements in both currencies or solely in U.S. dollars typically have extensive operations in the United States or want to tap U.S. capital markets to finance their operations. Most firms in this category still use Canadian dollars in their daily accounting operations, however, and base their U.S.-dollar statements on reports that are already completed in Canadian dollars.

Table 3: Denomination of Financial Statements

	Per cent of total responses (absolute number)		
	Can$	**US$**	**Both**
Canada	82 (81)	7 (7)	11 (11)
Atlantic Canada	94 (15)	0 (0)	6 (1)
Quebec	76 (16)	14 (3)	10 (2)
Ontario	76 (19)	8 (2)	16 (4)
Prairies	74 (14)	5 (1)	21 (4)
British Columbia	94 (17)	6 (1)	0 (0)

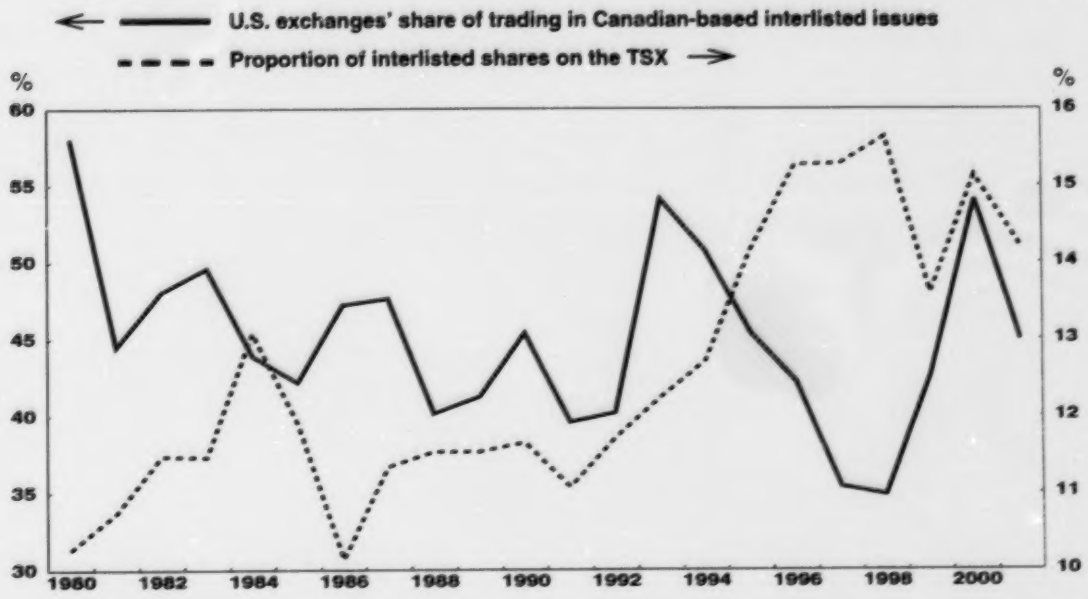
5.4 Other evidence

Multinational firms and companies whose shares are listed on U.S. exchanges are typically required to provide financial statements in U.S. dollars.[7] Some Canadian stocks that are traded on the Toronto Stock Exchange (TSX) are also quoted in U.S. dollars.[8]

The *Factbook* published by the NYSE suggests that 72 Canadian firms had stock listed on the NYSE in 2000, with a trading volume of over US$304 billion and a market capitalization of approximately US$116 billion. While these figures are impressive, and significantly higher than those reported in 1996, the numbers must be put into context.[9] The number of foreign firms listed on the NYSE grew by more than 42 per cent during this period, and Canada's share of all foreign stocks listed on the NYSE actually declined (from roughly 18 per cent to 16 per cent). Other industrial countries gained ground. The share of European stocks, for example, increased from roughly 45 per cent of the total market value to more than 53 per cent.

7. The first non-U.S. listing on the New York Stock Exchange (NYSE) was a Canadian company—The New York, Newfoundland, and London Telegraph Company Ltd. The company was listed on 29 June 1872. The oldest non-U.S. listing still trading on the NYSE is Canadian Pacific Ltd., which was listed in 1883.
8. As one might expect, there is considerable overlap between the companies with interlisted stock and those companies on the TSX that have shares quoted in U.S. dollars.
9. The *Factbook* indicates that 55 Canadian companies had stock listed on the NYSE in 1996, and that their market capitalization was US$60 billion.

Figure 2: Canadian Interlisted Companies



Source: TSX Review

Figure 2 shows the proportion of firms with stocks trading on the TSX that also have shares listed on a foreign exchange.[10] This proportion has increased from approximately 10 per cent in 1980 to 14 per cent at present. The proportion of total trading in these stocks that takes place on U.S. exchanges has remained relatively constant, however, at around 50 per cent, with a slight downward trend noticeable in the data.[11]

Additional insights into the degree of dollarization, measured in this manner, can be obtained from a report published by the TSX. The results of that report are summarized in Table 4. The figures reported in column 2 indicate the number of firms that are listed on the TSX and that have at least one share issue quoted in U.S. dollars. Their relative importance, expressed as a percentage of all firms listed on the TSX, is shown in column 4. Both the absolute number of firms with shares trading in U.S. dollars and their relative importance have been declining over time.

10. A further 35 Canadian companies are currently listed solely on U.S. exchanges, down from 53 in 1998.
11. These figures refer to the number of shares that are traded on U.S. exchanges as opposed to the TSX, and may understate the relative importance of U.S. trading activity, since the market value of interlisted firms is often greater than that of firms listed solely on the TSX.

Table 4: Companies Trading in U.S. Dollars on the Toronto Stock Exchange

Years	No. of U.S.-dollar companies	Total no. of companies on the TSX	Percentage of U.S.-dollar companies
1980	56	799	7.0
1985	61	966	6.3
1990	53	1193	4.4
1995	51	1258	4.1
2002	52	1306	4.0

Source: TSX Review

While these results may provide some comfort to those who view diversification and globalization as a threat, rather than a natural market phenomenon, it is clear that use of the U.S. dollar as a unit of account can be expected to rise with the proportion of Canadian business conducted outside our borders. Although this might not qualify as dollarization in the true sense of the term, it will, on balance, increase the savings that firms could realize if all their activities were priced in one currency—thereby increasing the attraction of a common currency. It is not obvious, however, that this point will be reached in the foreseeable future.

6. The U.S. Dollar as a Medium of Exchange

The second use of money is as a medium of exchange. Everyday experience would suggest that U.S. dollars are not typically used for transactions in Canada. Although U.S. currency is generally accepted in retail stores in Canada, usually close to market rates, and Canadian residents are free to hold foreign currency deposits in banks, examples of Canadians using U.S. dollars in transactions with other Canadians are rare. This may be surprising to outside observers, given the extent to which the Canadian and U.S. economies are integrated and the fact that 80 per cent of Canadians live within 100 miles (160 kilometres) of the U.S. border. As stated earlier, it is normal business practice in informally dollarized Latin American economies to denominate large-ticket items, including real estate, in U.S. dollars. U.S. cash is also widely accepted for smaller transactions.

Hard data on the extent to which U.S. dollars are used in Canada are limited. While statistics on U.S.-dollar deposits are available, no Canadian agency collects information on the amount of U.S.

currency held by Canadians and the extent to which such currency is used for transactions in Canada.

We examine three methods of measuring the extent to which U.S. dollars are used for transactions in Canada. The first method, using data collected by the Bank of Canada, focuses on the ratio of U.S. deposits held by Canadians in Canadian banks to broad money (M3). The ratio of foreign currency deposits to broad money has traditionally been used by the IMF and others as a proxy for assessing the extent to which a country is dollarized. This measure would likely understate the true extent of dollarization if significant amounts of foreign cash were held by domestic residents for transactions.

The second method uses confidential data from the U.S. Customs Service on reported cross-border flows of U.S. currency. By summing these flows over time, one can estimate the amount of U.S. cash that is in circulation within Canada. Since only flows reported to the authorities are captured in these data, they are likely to be biased. Other factors are also likely to distort such statistics.

The third method examines the holdings of U.S.-dollar currency by Canadian banks. Trends in these holdings might allow us to infer whether demand by Canadians for U.S. dollars is rising. It would be uncertain, however, whether a growing demand for U.S. currency reflected increased use within Canada or whether it was due to other factors, such as growing two-way tourism between Canada and the United States.

All of these measures provide biased views on the extent to which U.S. dollars are used as a transactions vehicle in Canada. None, however, suggests that Canadians use U.S. dollars in domestic transactions to any significant degree. Nor is there strong evidence of a rising trend in the use of U.S. currency in Canada.

Section 6.4 describes the results of stability tests on short-run demand equations for currency and broad money (M2++). These tests were used to ascertain whether there have been structural breaks or currency substitution effects, which might point to dollarization. The estimated equations are given in Appendix A.

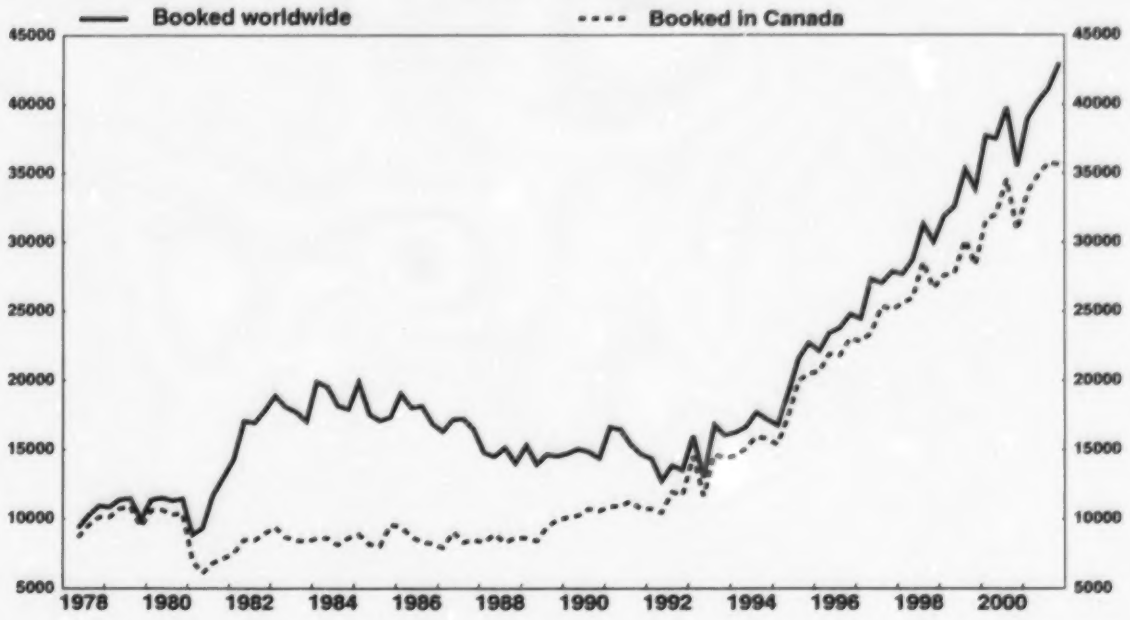
6.1 Ratio of foreign currency deposits in Canada to broad money

As stated above, the extent to which a foreign currency is used for transactions purposes is traditionally measured by examining the ratio of a country's foreign currency deposits to its money supply, broadly defined. This method is not a pure measure of the use of foreign currency

as a transactions vehicle, since some foreign currency deposits are held for other purposes; for example, as a store of value. It can also be a biased indicator, since it assumes that foreign currency deposits and foreign currency are close substitutes and that movements in one bear a strong relationship with movements in the other (Feige et al. 2000). This would be of particular concern in countries with weak or underdeveloped financial systems, because residents of such countries are more likely to rely on currency rather than on other forms of payment, such as cheques, debit cards, or credit cards.

In Figure 3, U.S.-dollar deposits of Canadian residents in Canadian banks are reported in U.S. dollars.[12] Data are reported both on a booked-worldwide and booked-in-Canada basis. While the trends in the two series have been broadly similar in recent years, there was a sizable divergence during the 1980s.[13] After holding relatively steady through the 1980s, U.S. deposits booked worldwide rose sharply in absolute terms through the 1990s, to stand at roughly US$43 billion in 2001. U.S.-dollar deposits booked in Canada by Canadian residents stood at about US$35 billion in 2001.

Figure 3: U.S.-Dollar Currency Deposits of Canadian Residents
(US$ millions)

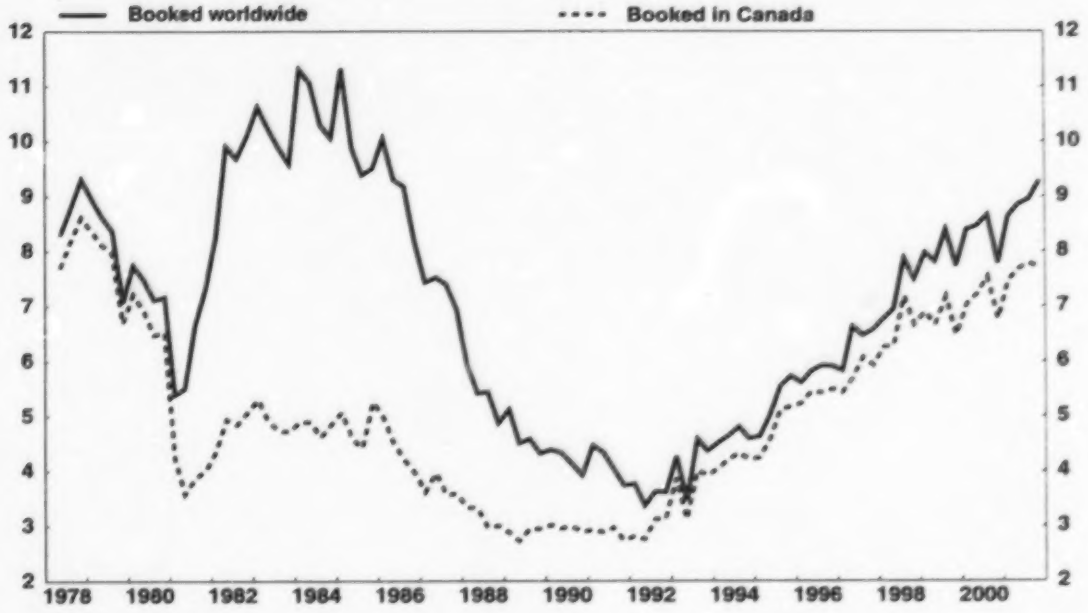


Source: Bank of Canada, Geographic Assets and Liabilities Booked in Canada and outside Canada

12. Data on total foreign currency deposits are also available. Because U.S.-dollar deposits account for the vast proportion of such deposits, however, and because we are interested in examining the extent to which U.S. dollars are used in Canada, we have focused on U.S.-dollar information.
13. Reserve requirements levied on domestic deposits but not on deposits booked outside of Canada might offer at least a partial explanation for the divergence. Reserve requirements were phased out during the early 1990s.

Figure 4 shows the same data, converted into Canadian dollars and scaled as a proportion of broad money (M3). Again, there is a sharp pickup in the proportion of U.S. deposits through the 1990s, touching slightly over 9 per cent on a booked-worldwide basis in 2001, up from roughly 3 per cent in 1992. On a booked-in-Canada basis, the pickup was about the same, rising to slightly less than 8 per cent in 2001 from under 3 per cent in the early 1990s. These ratios have fluctuated over a wide range during the past 25 years. In neither case is the current level exceptional.

Figure 4: U.S.-Dollar Currency Deposits of Canadian Residents as a Percentage of M3
(expressed in Canadian dollars)



Source: Bank of Canada, Geographic Assets and Liabilities Booked in Canada and outside Canada

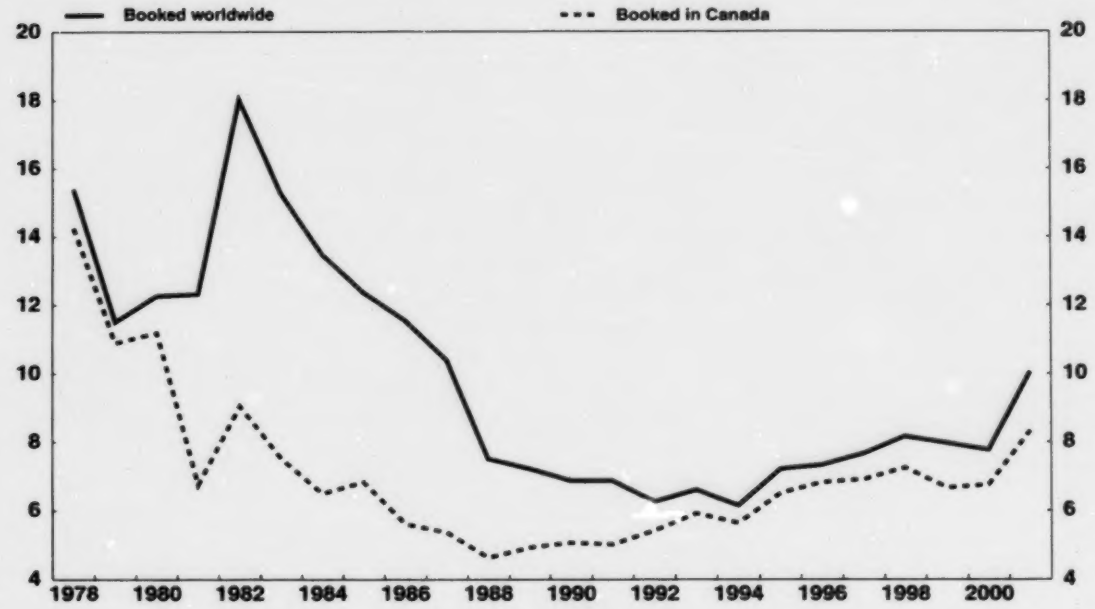
Part of the rise in the ratio of U.S.-dollar deposits to M3 simply reflects the appreciation of the U.S. dollar against its Canadian counterpart. Using a constant (1 for 1) exchange rate, the increase in the ratio is more muted. On this basis, the booked-worldwide and booked-in-Canada ratios currently stand at about 6 per cent and 5 per cent, respectively, still up significantly from the early 1990s, but lower than ratios seen in the past.

Factors behind the large swings in the ratio of U.S.-dollar deposits to broad money are not immediately obvious. Currency substitution might provide one answer, with Canadians reducing

their holdings of U.S. dollars as the Canadian dollar strengthened during the second half of the 1980s, and increasing such holdings as the Canadian dollar subsequently weakened during the 1990s.

The steady rise in U.S.-dollar deposits since the beginning of the 1990s could also reflect growing Canada–U.S. economic integration following the signing of the Free Trade Agreement (FTA) in 1988. Growing two-way trade with the United States may have increased the demand for U.S.-dollar balances by Canadian firms, which account for more than two-thirds of foreign currency deposits held in Canadian banks. Despite the rapid growth of continental trade, U.S.-dollar deposits, as a percentage of trade (exports and imports of goods and services) with the United States, have increased only modestly since the late 1980s (Figure 5).

Figure 5: U.S.-Dollar Currency Deposits of Canadian Residents as a Percentage of Trade with the United States
(expressed in Canadian dollars)

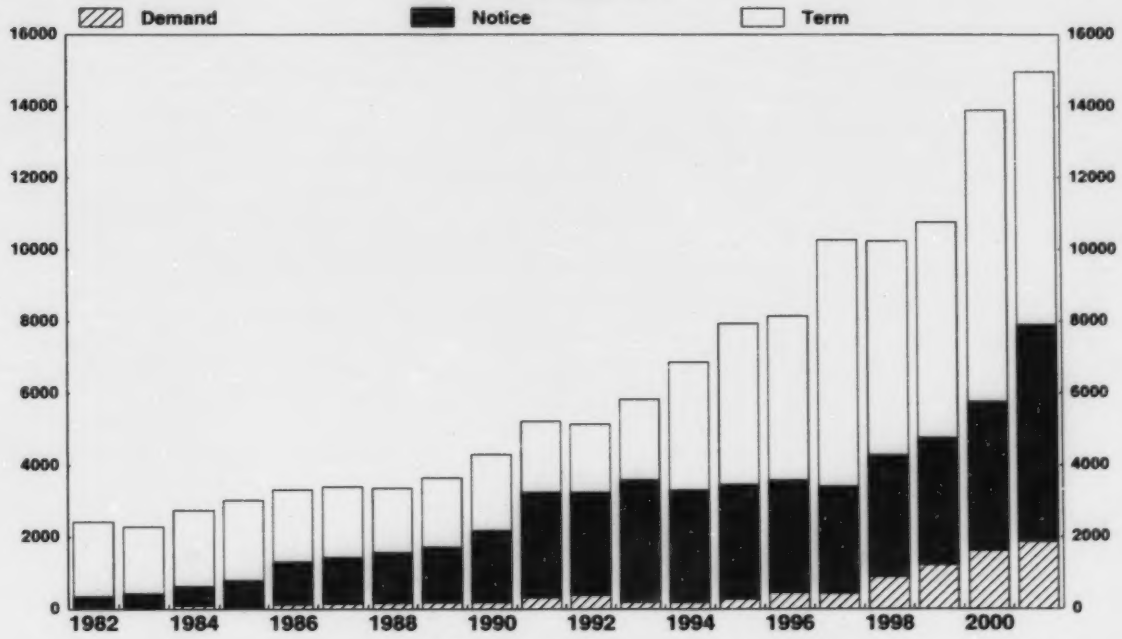


Source: Bank of Canada, Geographic Assets and Liabilities Booked in Canada and outside Canada

As stated earlier, people hold foreign currency for purposes other than domestic transactions. A decomposition of the data on the foreign currency deposits of Canadian individuals (Figure 6) indicates that the amount of U.S. dollars held in demand accounts—the type of account usually

used for transactions—is relatively small, despite some recent growth. This suggests that the reason Canadians are holding foreign currency deposits is probably not related to the transactions demand for money.

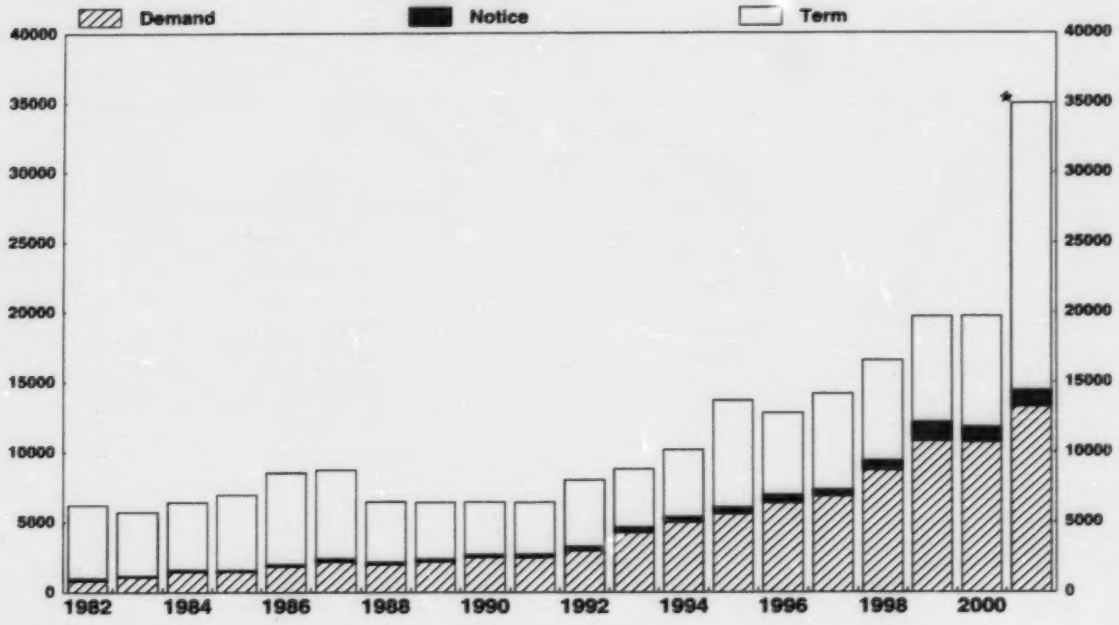
Figure 6: Total U.S.-Dollar Deposits Payable to Canadian Residents (Individuals)
(US$ millions)



Source: Office of the Superintendent of Financial Institutions (OSFI) Deposit Liabilities Classified by Institutional Sector Report

The U.S.-dollar deposits of Canadian firms have, however, increased steadily over the past decade (Figure 7). This trend is consistent with growth in trade with the United States since the signing of the FTA.

Figure 7: Total Foreign Currency Deposits Payable to Canadian Residents (Firms)
(US$ millions)



* Break in series in 2001
Source: OSFI Deposit Liabilities Classified by Institutional Sector Report

6.1.1 A comparison with other countries

Baliño, Bennett, and Borensztein (1999) identify several countries whose ratio of foreign currency deposits to total bank deposits exceeded 30 per cent in 1995. These included Argentina, with a ratio of foreign currency deposits to broad money of 44 per cent, Bolivia at 82 per cent, Turkey at 46 per cent, and Uruguay at 76 per cent. Similar ratios for selected industrial countries ranged from 4.4 per cent for the Netherlands to 21.6 per cent for Greece. The ratio for the United Kingdom was 15.4 per cent. On this basis, Canada, with only 10 per cent, cannot be considered a dollarized economy.

6.2 Currency and monetary instruments reports

Since 1980, the U.S. Customs Service has required individuals and companies shipping US$10,000 or more in cash across the border to complete a currency and monetary instruments report (CMIR), indicating the size, origin, and destination of the shipment.[14] These reports are

14. The U.S. Customs Service began collecting these reports in 1977. The threshold amount was increased from US$5,000 to US$10,000 in 1980.

confidential. From time to time, however, aggregate information has been made available to researchers. This information provides some insight into how much U.S. currency is in circulation outside of the United States and the location of that currency.

While, theoretically, CMIRs should be a good source of information regarding the extent to which countries are dollarized, there are many reasons to believe that they are biased. As noted by Porter and Judson (1996), CMIR data are distorted by at least four factors. First, only travellers entering the United States are required to pass through customs. Consequently, outflows of U.S. currency are likely to be underreported. Second, shipments of currency of less than US$10,000 are not captured by the CMIR data system. This could be particularly significant for Canada, given its proximity to the United States and the number of cross-border visits that occur annually. Third, it is likely that some shipments of greater than $10,000 are misreported and unreported: some individuals, particularly those engaged in illegal activities, would seek to avoid reporting. Fourth, the CMIRs were designed to track individual transactions, rather than to provide aggregate data on currency movements. Consequently, errors, including double counting, can arise when the data are aggregated.

Despite these caveats, CMIR data provide an interesting perspective on U.S.-dollar flows and can shed some light on the extent to which there is net demand for U.S. currency outside the United States. Large, persistent net outflows of U.S. cash to a country would be evidence that U.S. dollars are being used for transactions (and possibly other purposes) by individuals and companies resident in that country.

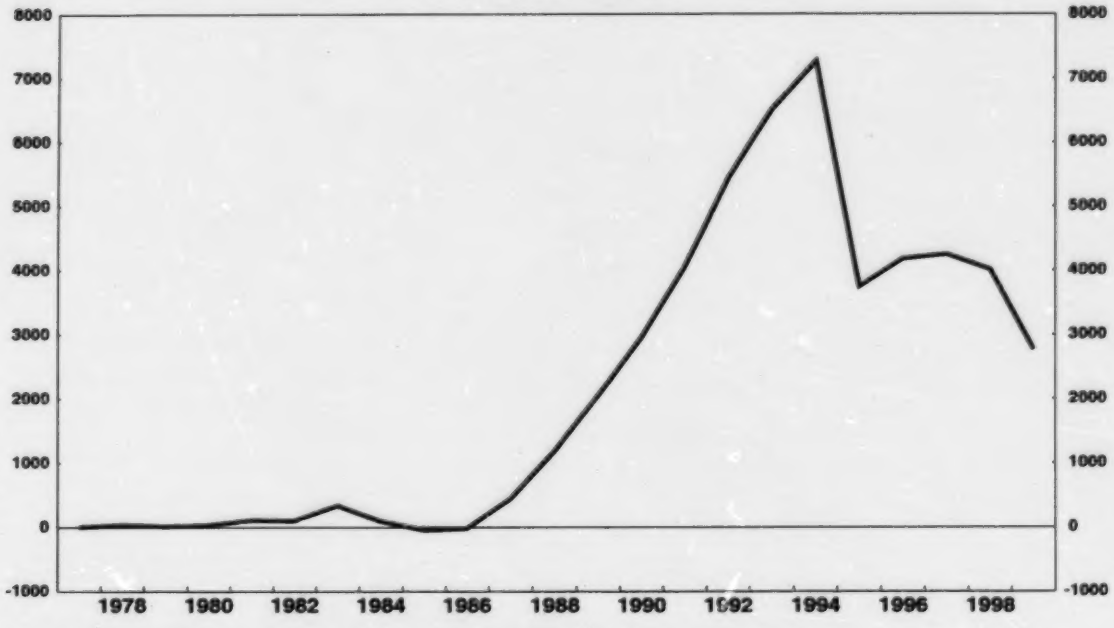
Figure 8 shows aggregate CMIR data for Canada over the 1977–99 period.[15] Over these years, net inflows of U.S. dollars in cash total roughly US$3 billion, with most of the inflows occurring during the second half of the 1980s and the first half of the 1990s.[16] Most recently, demand for

15. The Federal Reserve Bank of New York is another source of data on inflows of U.S. currency into Canada. It tracks the flow of U.S. currency to and from commercial bank note brokers located in New York. Such brokers, primarily the large commercial banks, account for the bulk of such shipments. Banks located in foreign countries seeking U.S. currency buy the cash from brokers. Similarly, foreign banks holding excess U.S. cash sell the unwanted currency to brokers. Since banks shipping and receiving amounts in excess of US$10,000 must file CMIRs, the Fed data represent a subset of the CMIR data. Consequently, for our report, we have relied on the more comprehensive CMIR data. While not detailed here, Fed data for 1990–2001 generally corroborate the CMIR data, although the cumulative net inflows are roughly double those of the CMIR. While cash flows into Canada are very similar under the two series, movements of U.S. cash out of Canada differ markedly, with the Fed data tracking significantly lower than the CMIR data. The annual direction of net flows of the two series is, however, similar, with both series suggesting net outflows of U.S. cash from Canada to the United States in recent years.

16. The stock of U.S. dollars circulating in Canada would be higher because there were undoubtedly some U.S. dollars in circulation prior to 1977, the starting point for the series. We can probably assume that the amount was quite small, however, given the negligible inflows that occurred during the late 1970s and early 1980s. The stability of the Canadian dollar during the 1960s and its strength during the first half of the 1970s would also have reduced the incentive of Canadian residents to hold U.S. dollars during those years.

U.S. currency has declined. Indeed, sizable outflows were recorded in three of the five years ending in 1999. Corroborating data from the Federal Reserve Bank of New York suggest that large outflows of U.S. currency may have continued in 2000 and 2001.[17]

Figure 8: Cumulative Net U.S.-Dollar Inflows (CMIR data) into Canada
(US$ millions)

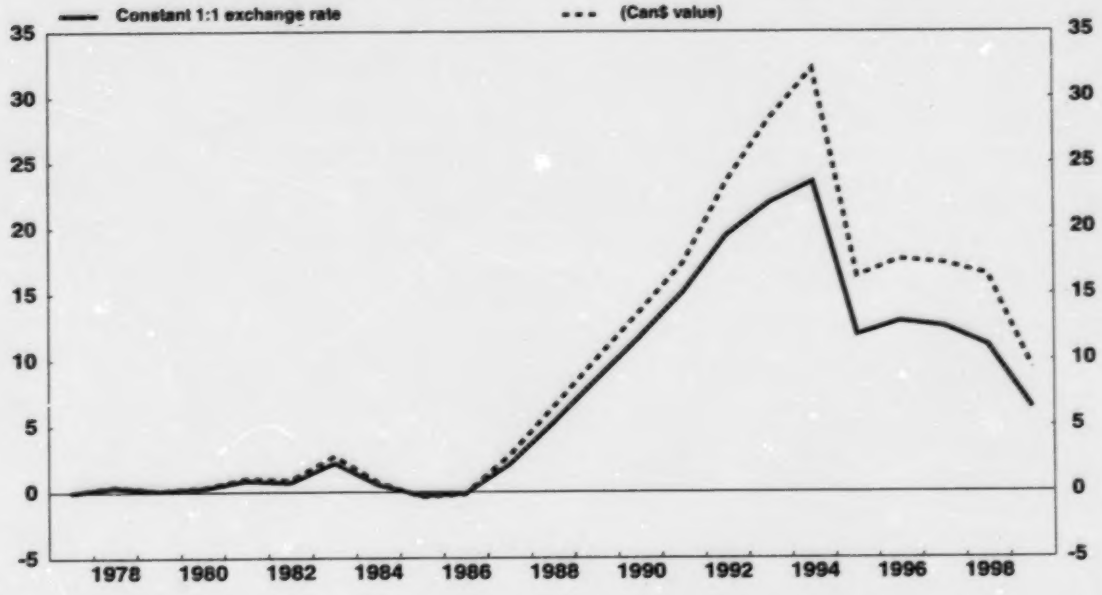


Note: Currency and Monetary Instrument Reports were collected by the U.S. Customs Service.
Source: U.S. Federal Reserve Board of Governors

The question remains whether the total inflows of U.S. dollars are significant even if the demand for U.S. currency appears to be declining in recent years. Figure 9 plots the cumulative inflow of U.S. dollars, based on the CMIR data, as a proportion of Canadian notes and coins in circulation. Two alternative series are plotted. One values the U.S. dollars at the going exchange rate, while the other uses a constant exchange rate to see through movements in the ratio caused purely by exchange rate movements.

17. According to Fed data, net flows of U.S. currency into Canada decelerated in the mid-1990s and turned consistently and increasingly negative from 1998 to 2001.

Figure 9: Cumulative Net U.S.-Dollar Inflows of US$ (CMIR data) as a Percentage of Canadian Notes and Coins in Circulation



Notes: Currency and Monetary Instrument Reports were collected by the U.S. Customs Service. Prior to 1981, data on notes only were collected.
Sources: U.S. Federal Reserve Board of Governors; Bank of Canada - b251 (Notes); Royal Canadian Mint, Memorandum of Subsidiary Canadian Coin in Circulation (Coins)

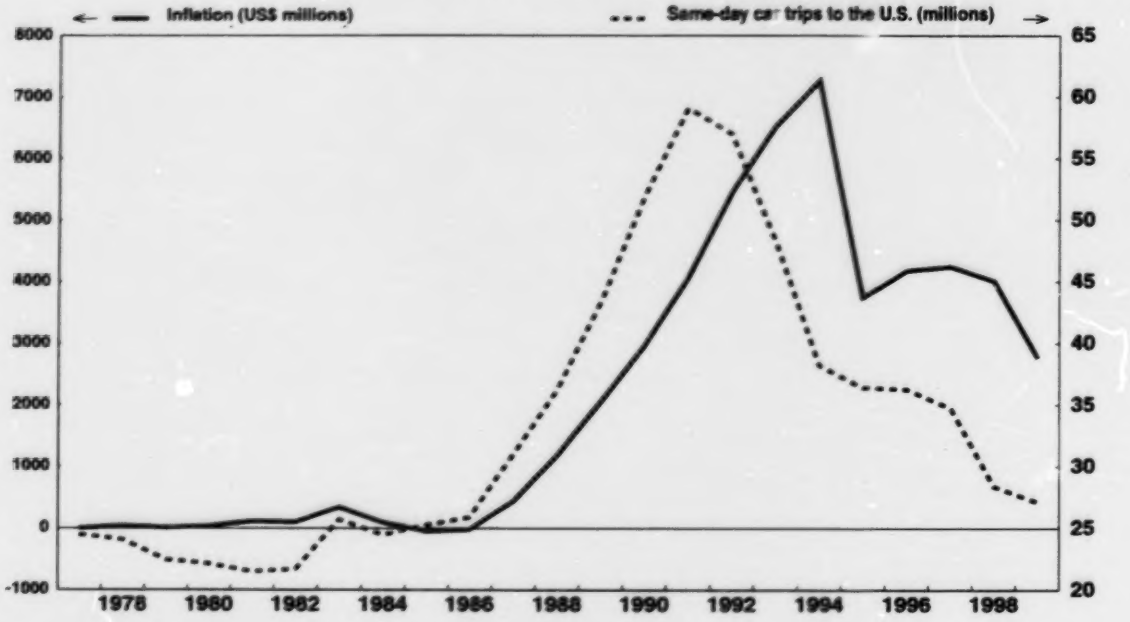
Both ratios, after fluctuating close to zero until the mid-1980s, rose steadily through the second half of the 1980s and the early 1990s. At prevailing exchange rates, the CMIR data suggest that the amount of U.S. dollars in circulation at their peak in 1994 was more than 30 per cent of the outstanding stock of Canadian notes and coins in circulation. This is a surprisingly high figure. By 1999, however—the last year for which data are available—this ratio had fallen to about 9 per cent.

The reason for the temporary increase in demand for U.S. cash by Canadians during the late 1980s and early 1990s is not immediately obvious. The fact that this phenomenon occurred during a period when the Canadian dollar was strengthening, or was relatively strong, against its U.S. counterpart deepens the mystery. Superficially, the data would be consistent with increased use of U.S. dollars by Canadians. But the fact that U.S.-dollar deposits of Canadians declined during this period does not support this interpretation.

It is quite likely that the increased demand for U.S. cash by Canadians was related to increased transactions with U.S. residents as opposed to Canadian residents. Through the late 1980s and early 1990s, there was a steady rise in same-day car trips by Canadian residents to the United

States, as Canadians, taking advantage of their relatively strong currency, shopped in U.S. border cities. Because U.S. stores typically accept only U.S. bank notes, the demand for U.S. cash by Canadians likely increased.[18] Same-day trips peaked in 1991 at roughly 58 million trips per year, up from only 25 million in 1986. As the Canadian dollar weakened through the 1990s, the number of day trips declined. By 1999, the number of such trips had returned approximately to the 1986 level. As Figure 10 shows, there was a strong positive correlation between net holdings of U.S. dollars by Canadian residents and cross-border shopping during the late 1980s and early 1990s.[19]

Figure 10: Cumulative Net U.S.-Dollar Inflows (CMIR data) into Canada and Same-Day Car Trips to the United States



Note: Currency and Monetary Instrument Reports were collected by the U.S. Customs Service.
Sources: U.S. Federal Reserve Board of Governors; Statistics Canada - Car Trips V129491

The declines in cross-border shopping and in U.S.-dollar holdings by Canadians as measured by the CMIR data are not exactly coincident. Day trips to the United States by Canadian residents peaked roughly two years before the peak in U.S.-dollar holdings by Canadians. While one would not necessarily expect a perfect fit, it is possible that U.S.-dollar holdings by Canadian residents were being influenced by another temporary factor—cross-border smuggling of tobacco products.

18. Canadian banks supplying the U.S. dollars to Canadian travellers would buy the U.S. currency from U.S. banks, who would in turn fill out a CMIR (assuming the shipment was in excess of US$10,000), indicating an outflow of U.S. dollars from the United States to Canada.

19. It is most unlikely that Canadians shopping in the United States would have been carrying US$10,000 or more in cash. Hence, they would not have been required to fill out a CMIR form upon entering the United States. Consequently, the stock of U.S. dollars in circulation in Canada as calculated by the CMIR data would be biased upwards.

During the early 1990s, the imposition of high excise taxes on tobacco products by the federal and provincial governments led to a surge in cross-border smuggling, particularly in central and eastern Canada. Tobacco products, made in Canada, were exported tax-exempt to U.S. wholesalers. The products were subsequently sold to Canadians and smuggled back to Canada.

The extent of the smuggling was enormous. The federal government estimated that smuggling accounted for roughly 40 per cent of the $12.4 billion Canadian tobacco market in 1993, up from only 5 per cent in 1990 (Office of the Prime Minister 1994).

Because such activities were illicit, it is reasonable to presume that transactions were mainly in cash. And because such purchases were being made from U.S.-based distributors, it is also reasonable to assume that transactions were often conducted in U.S. dollars.[20]

A plausible, but admittedly circumstantial, case can therefore be made that the apparently substantial, yet temporary, increase in U.S. dollars in Canada during the late 1980s and early 1990s was related to legal and illegal cross-border shopping. Demand for U.S. currency subsequently fell as the Canadian dollar depreciated, thus reducing the incentive for legal cross-border shopping, and following the reduction in tobacco excise taxes in 1994, which reduced the incentive for tobacco smuggling.

6.2.1 A comparison with Argentina

Another measure of the importance of U.S.-dollar holdings by Canadians can be obtained by comparing the Canadian experience with that of Argentina. Figure 11 charts similar CMIR data for Argentina alongside the Canadian data. It shows that net inflows into Argentina over the 1977–98 period amounted to US$44 billion, over ten times more than cumulative inflows to Canada over the 1977–99 period. This difference is all the more striking given that Argentina's GDP is only a fraction of Canada's. In Argentina, more than US$1,000 is in circulation for every man, woman, and child, compared with less than US$100 per person in Canada.[21] Using Argentina as a benchmark, Canada is clearly not dollarized.

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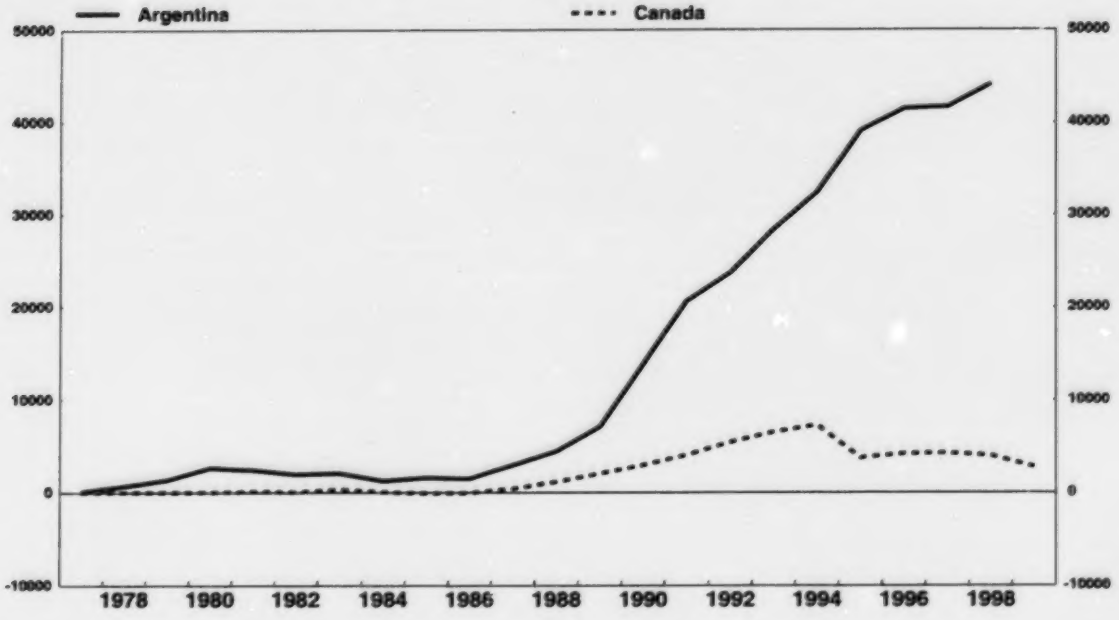
20. As would have been the case with cross-border shoppers, it is very unlikely that CMIR forms were filled out by smugglers. Again, the stock of U.S. dollars in circulation in Canada, as measured by the CMIR data, would be biased upwards.

21. Given that outflows of U.S. currency owing to cross-border shopping, both legal and illegal, are not likely to be captured by the CMIR data, the stock of U.S. currency in circulation in Canada is likely to be lower than the cumulative reported flows. Consequently, the amount of U.S. dollars per capita in Canada could be much lower than $100.

Figure 11: Cumulative Net U.S.-Dollar Inflows (CMIR data) into Argentina and Canada
(US$ millions)



Note: Currency and Monetary Instrument Reports were collected by the U.S. Customs Service.
Source: U.S. Federal Reserve Board of Governors

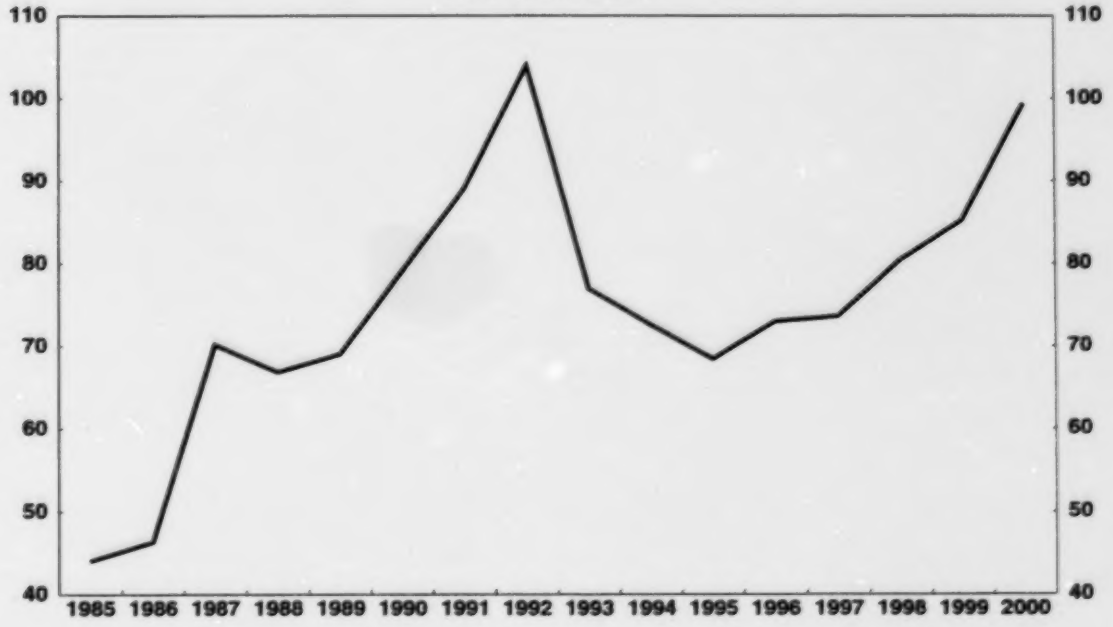
6.3 Holdings of U.S. dollars by Canadian banks

Another way of measuring the trend in U.S.-dollar holdings in Canada is to examine the stock of U.S. currency held by Canadian banks. Rising demand for U.S. currency should be reflected in growing stocks of U.S. currency in banks. Unfortunately, holdings of U.S. cash are not routinely reported by Canadian banks. The Canadian Bankers Association conducted a special survey on our behalf, in which three of the six major banks were able to provide consistent data for the 1985–2000 period. Two other banks were able to give partial information. If we assume that the three banks are representative of the entire banking system, there was little net change in the amount of U.S. bank notes held by Canadian banks over the 1990s (Figure 12). Over the fifteen-year period, however, their holdings of U.S. currency more than doubled. Holdings of Canadian-dollar cash rose by slightly more than one-third over the same period.[22]

22. Prior to the phasing-out of reserve requirements during the early 1990s, banks could count their vault holdings of Canadian dollars towards meeting reserve requirements. The elimination of reserve requirements gave banks an incentive to economize on their holdings of Canadian currency that had not existed earlier.

Interestingly, the survey data indicate that holdings of U.S.-dollar cash in Canadian banks rose temporarily during the late 1980s and early 1990s. This is consistent with the CMIR data from the United States. The temporary increase in U.S.-dollar cash holdings by Canadian banks, presumably linked to greater demand for U.S. currency by Canadians, would also be consistent with the cross-border shopping explanation. Given the limited size of the survey, one should be cautious about drawing strong conclusions.

Figure 12: U.S. Currency Holdings of Canadian Banks
(US$ millions)



Note: Sample of three banks
Source: Canadian Bankers Association (CBA)

6.4 Stability of currency and money equations

In Appendix A, short-run demand equations for currency and broad money (M2++) are estimated using single-equation, error-correction models. The stability properties of the estimated functions are then examined for structural breaks. To test for currency substitution effects, the Canada/U.S. bilateral exchange rate is included in both equations. In the case of the currency-demand equation, the coefficient on the exchange rate term was consistent with currency substitution over the 1961–2001 sample period and was statistically significant. The significance of the exchange rate term, however, was the result of data from the first half of the sample period (1961–80). In the second half of the sample period, the exchange rate term was incorrectly signed and was not significant,

suggesting no currency substitution. In the case of the M2++ equation, the coefficient was correctly signed but statistically insignificant.

7. The U.S. Dollar as a Store of Value

The third use of money is as a store of value. This section explores the extent to which Canadians invest their savings in U.S.-dollar assets and how this may have changed over time. Also examined is the currency in which Canadians denominate their liabilities and how this too may have evolved. Consequently, both sides of Canadian balance sheets are examined.

7.1 Assets of Canadians

Table 5 lists estimates of the currency distribution of holdings in Canadian mutual funds, pension funds, and other pooled funds over the 1997–2000 period.[23] The share of assets denominated in Canadian dollars declined steadily from 75 per cent in 1997 to 67 per cent in 2000, with the share of foreign assets rising concomitantly from 25 per cent to 32 per cent. The share of identified U.S.-dollar assets rose from 13 per cent to 19 per cent over the period.

Table 5: Holdings in Equities and Bonds of Mutual, Pension, and Other Pooled Funds
Distribution of Portfolio Assets by Currency of Denomination
(per cent)

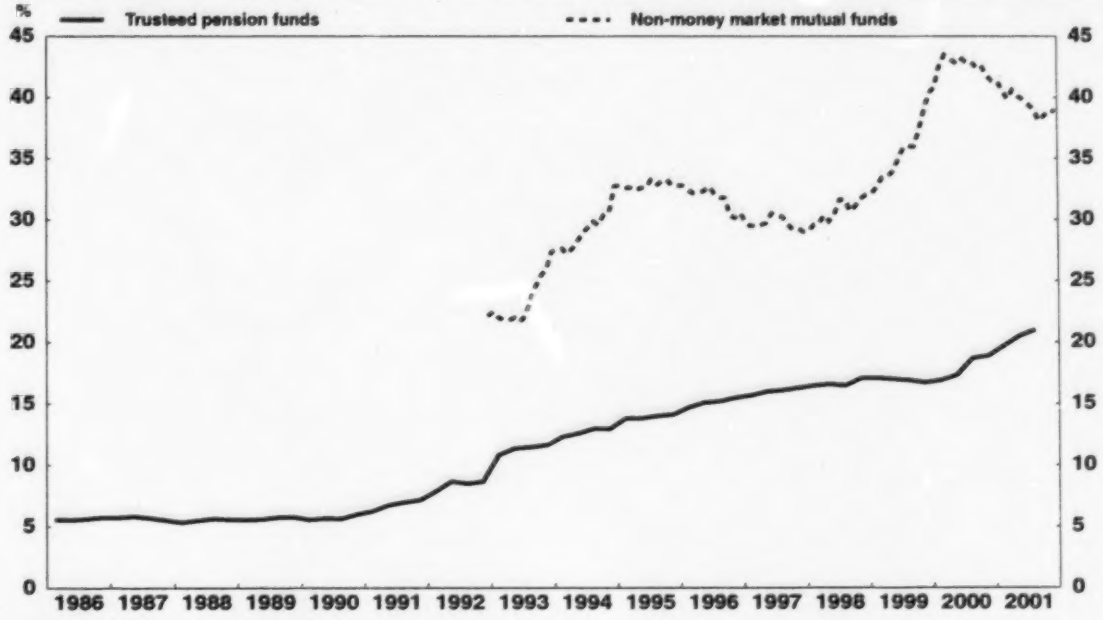
Currency group	1997	1998 share	1999 share	2000 share
Canadian dollar	75	72	68	67
U.S. dollar	13	15	17	19
Other currency	6	7	7	9
Unidentified currency[1]	5	5	8	4
TOTAL	100	100	100	100

Note: Canadian stocks and bonds are considered to be 100 per cent Canadian dollars and U.S. stocks are considered to be 100 per cent U.S. dollars.
1. Contains foreign assets only.
Source: Statistics Canada

23. No data prior to 1997 are available.

Figure 13 shows a longer, but less-detailed, time series for the foreign content of trusteed pension funds as well as for non-money-market mutual funds. There has been a consistent upward trend in the foreign-denominated assets of pension funds over the past decade.[24] The bulk of foreign currency assets is believed to be denominated in U.S. dollars.

Figure 13: Foreign Content of Trusteed Pension Funds and Mutual Funds



Note: The funds are non-money market.
Sources: Trusteed pension funds - book-value basis, Statistics Canada. Mutual funds - market-value basis, Investment Funds Institute of Canada.

This increase has at least been partly in response to changes in regulations governing the foreign content of tax-sheltered investment funds. While Canadians are free to invest in foreign assets without constraints, the federal government has limited the extent to which pension funds, as well as mutual funds eligible to be held in registered retirement plans, can invest in foreign assets.[25] This ceiling, which was set at 10 per cent prior to 1991, was raised in steps to 20 per cent in 1994 and to 30 per cent effective January 2001.[26]

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24. These data are on a book-value basis.
25. Some funds have circumvented the regulation through the use of derivative products.
26. Limits on the foreign content of private pension funds are quite common in OECD countries. Compared with other OECD countries, Canada was, as of 1994, considered as having a "medium" level of restrictions. Reasons that countries impose restrictions on foreign content include retaining domestic savings for investment, having a captive source of funds for government borrowing, and enabling governments to direct resources to particular industries (Reisen 2000).

Because not all mutual funds are eligible for inclusion in registered retirement plans, some are not subject to the foreign-content restrictions. It is therefore not surprising that the foreign content of mutual funds, as a group, is higher than that of trusteed pension funds. An additional explanation would be that the mutual funds data are on a market-value basis, while the pension funds data are on a book-value basis and therefore might not fully capture the current value of the assets, particularly if the assets were acquired a long time ago. In both cases (but especially for mutual funds, given their market valuation), the depreciation of the Canadian dollar would be another contributing factor to the rise in the value of the foreign component.

7.1.1 Comparison with other countries

The foreign currency component of Canadian pension and mutual funds has steadily increased over time. How does this experience compare with that of other countries? Is the fact that Canadians are holding an increasing portion of their wealth in U.S.-dollar-denominated assets a sign of dollarization, or of something else?

Table 6 lists the percentages of non-domestic assets held by pension funds in a range of OECD countries as well as an estimate of what the percentage is likely to be in 2005.[27] As the table shows, the Canadian experience is not exceptional. If anything, Canadian pension fund portfolios appear to be relatively underweight in foreign assets, reflecting at least in part government restrictions on foreign content. With the easing of such restrictions in 2001, the share of non-domestic assets is expected to rise significantly by 2005. Even so, the anticipated proportion (29 per cent) would remain relatively low compared with what is currently the case in many other countries, particularly in those that maintain a low level of restriction on foreign investment. For smaller countries (e.g., Ireland, the Netherlands, Belgium), non-domestic assets accounted for as much as two-thirds to three-quarters of pension portfolios. Even for large countries, like the United Kingdom, the ratio is approaching 30 per cent. Given the economic size of the United States, it is not surprising that the share of foreign assets in U.S. pension funds is relatively low. But their ratio is also steadily rising.

Several factors explain the growing internationalization of pension fund portfolios: the easing of government restrictions on foreign content; better communications and information regarding foreign companies, which have reduced transactions and monitoring costs; demographic factors, which may have pushed pensions to look for better returns; and, most importantly, diversification. International diversification can simultaneously raise returns and lower risk if pension funds invest in countries where returns are relatively uncorrelated with returns in the domestic country.

27. See InterSec Research Corporation (2001).

Table 6: Non-Domestic Investment in OECD-Country Pension Funds (percentage)

	1995	2000	2005 estimate
Australia[1]	17	23	29
Belgium	36	63	65
Canada	18	17	29
Finland	2	31	38
France	7	14	17
Germany	3	16	17
Ireland[1]	38	61	65
Japan	13	21	24
Netherlands[1]	18	65	73
Spain	3	23	37
Sweden	0	11	26
Switzerland	11	27	31
United Kingdom[1]	25	27	30
United States[1]	10	11	14

1. Judged to have a low level of regulatory constraint on foreign investment (Reisen 2000).

Source: InterSec Research Corporation (2001)

Even pension funds that are not subject to foreign content restrictions are underweight in foreign assets based on portfolio theory. There are a number of potential explanations for this "home bias" on the part of pension funds. One is that pension funds may try to maintain the real domestic purchasing power of their assets, leading them to maintain a currency exposure equivalent to the weight of imports in the CPI. This weight may be different from the optimal weight of foreign content weight as determined by portfolio theory.[28]

The above evidence suggests that while Canadians are indeed holding an increasing proportion of their assets in U.S.-dollar-denominated instruments, this trend has more to do with the easing of

28. See Reisen (2000).

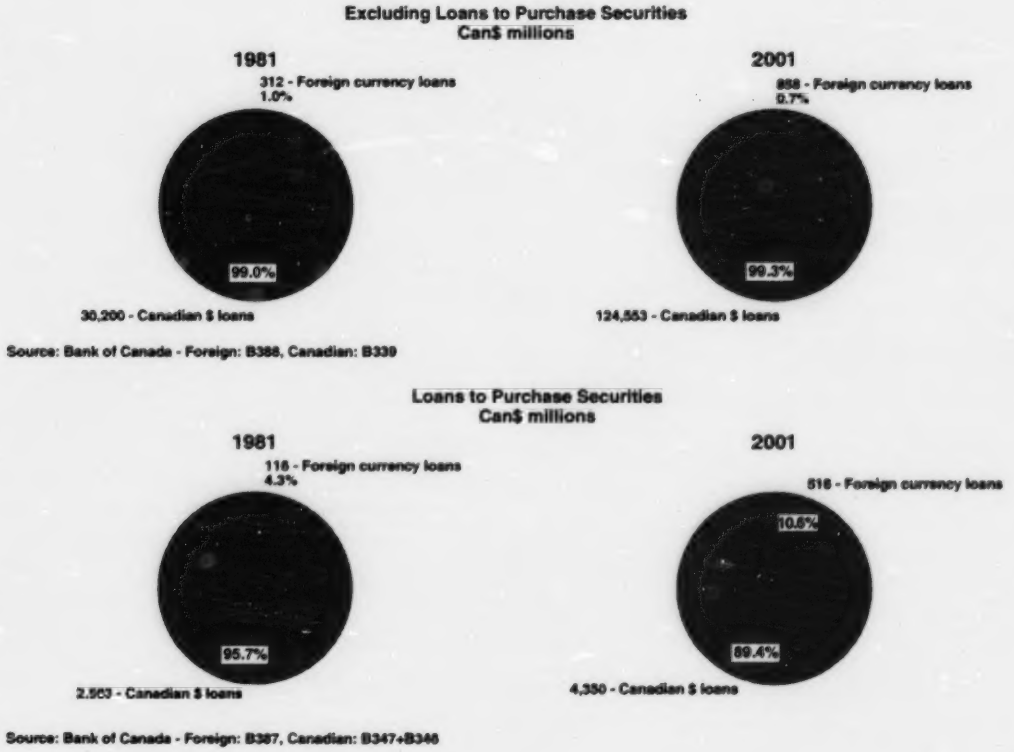
government restrictions and portfolio diversification than with dollarization. The Canadian experience is also not unique. Portfolio diversification is a feature of pension funds in all OECD countries. Moreover, the foreign content of Canadian pension funds is considerably lower than that of similar funds overseas.

7.2 Liabilities of Canadians

In this section, the extent to which Canadian individuals and firms borrow in foreign currency is examined. For individuals, bank lending to purchase consumer goods and services is studied, as well as bank lending to purchase securities. For Canadian firms, bank lending as well as market borrowings are examined.

Generally, consumer lending of foreign currency by Canadian banks to Canadian individuals has been on a slow upward track in current dollar terms over the past 20 years. But as a share of total bank lending, foreign currency lending accounted for slightly less than 1 per cent in 2001, unchanged from its share in 1981 (Figure 14).

Figure 14: Loans to Canadian Individuals for Non-Business Purposes



The share of foreign currency lending for purchasing securities as a proportion of total lending for such purposes has more than doubled over the past 20 years, to roughly 10 per cent. This type of lending to Canadian residents rose sharply during the late 1990s, peaking in 2000. This undoubtedly reflected the strong returns then available in foreign equity markets, particularly in the United States. Weakening equity markets led to a decline in such lending in 2001.

Foreign currency lending to Canadian firms has also been on a slow upward track in current dollar terms over the past 20 years. As with consumer lending, however, the share of foreign lending as a proportion of total business lending has remained essentially constant, at roughly 18 per cent (Figure 15).

Figure 15: Foreign Lending as a Proportion of Total Business Lending
(Can$ millions)

Source: Bank of Canada - Foreign: B357, Canadian: B311

Important industrial sectors that experienced a large increase in their foreign currency borrowing over the past 20 years include the manufacturing sector—where more than 30 per cent of that sector's total bank borrowing in 2001 was in foreign currency, up from 17.5 per cent in 1981—and the transportation, communications, and other utilities group, where borrowing rose from 13 per cent to 31 per cent over the same period. Increases in these sectors were offset by declines in foreign currency borrowing by the construction and real estate sector, where the share of foreign currency borrowing fell to 12.5 per cent in 2001 from 18.6 per cent in 1981, and by conglomerates, which fell to 5 per cent from 25 per cent.

In contrast with foreign currency lending by banks, there has been strong growth in U.S.-dollar bond issues by Canadian firms over the past 25 years. Consequently, the share of Canadian-dollar issues (including euro-Canadian issues) as a proportion of total outstanding bonds issued by

Canadian corporations has fallen from 80 per cent in 1975 to 46 per cent in 2001 (Table 7). Outstanding U.S.-dollar issues have risen from 19 per cent to 49 per cent over the same period.

Table 7: Distribution of Outstanding Bonds Issued by Canadian Corporations (per cent)

	Can$	US$	EuroCan$[1]	EuroUS$[1]	Other
1975	79	19	1	0	0
1980	62	25	6	6	1
1985	47	23	7	16	7
1990	46	17	14	8	15
1995	43	35	8	6	8
2000	47	37	3	9	5
2001	44	42	2	7	5

1. EuroCan$ are Canadian-dollar issues placed outside of Canada; EuroUS$ are U.S.-dollar issues placed outside the United States.
Source: *Bank of Canada Review* Table K8.

Nevertheless, Canadian-dollar issues placed in Canada have been broadly stable since 1985. The share of U.S.-dollar-denominated bonds increased at the expense of issues denominated in third currencies, and euro-Canadian-dollar issues, which peaked at a 14 per cent share in 1990 and fell steadily to only 2 per cent in 2001. The decline of euro-Canadian issues was likely the result of waning overseas investor interest in Canadian-dollar bonds as the Canadian dollar depreciated and as interest differentials narrowed or shifted to favour U.S. instruments.

Table 8 reports on net equity issues of Canadian corporations. As the table shows, only 7 per cent of such issues were placed abroad, on average, in the 1996–2000 period. In other words, the vast proportion of equity raised by Canadian corporations was placed in Canada. The 7 per cent figure likely provides an upper limit on the amount of equity issued in foreign currency (i.e., U.S. dollars). Equity issues placed in Canada but denominated in foreign currency are rare.

Table 8: Canadian Corporate Equity Issues Placed Abroad: 1955–2000

Period	Per cent of total net corporate stock issues placed abroad
1955–60	1
1961–65	3
1966–70	10
1971–75	3
1976–80	3
1981–85	3
1986–90	6
1991–95	12
1996–2000	7

Source: Bank of Canada

8. Main Messages and Policy Implications

The evidence presented in this report suggests that many of the concerns (or hopes) that have been expressed about the imminent dollarization of the Canadian economy are misplaced. The Canadian dollar continues to be used as the principal unit of account, medium of exchange, and store of value within our borders, and there is no indication that dollarization is likely to take hold in the foreseeable future.

The situation in Canada bears little resemblance to that of countries such as Argentina, whose financial systems are generally regarded as being truly dollarized. Indeed, use of the U.S. dollar is well below the normal benchmarks used to define dollarization. Relative to many other industrial economies, we are remarkably "undollarized." Despite the close proximity of the U.S. economy and the evident importance of U.S. exports and imports to the Canadian economy, very little informal dollarization has taken place. The significance of the U.S. dollar as a unit of account, medium of exchange, and store of value is often greater in countries like Japan and the United Kingdom than it is in Canada.

Most goods and services in our country are priced exclusively in Canadian dollars, unless they are destined for the U.S. market or involve the sale of a primary product. The same is true for the

preparation of corporate financial statements, unless the company is a large multinational and conducts most of its business outside Canada. Firms with interlisted shares are often required to use the U.S. dollar for reporting purposes, but the relative importance of Canadian firms with stock listed on the NYSE and other U.S. exchanges has actually been declining over time—compared with other foreign firms and as a share of the firms listed on the TSX. In short, the U.S. dollar is seldom used as a unit of account for domestic transactions.

The same can be said of the U.S. dollar as a medium of exchange. The absolute value and percentage share of Canadian bank deposits that are denominated in U.S. dollars was on a rising trend through most of the 1990s. The relative importance of such deposits was actually higher, however, in the late 1970s and early 1980s. Currency holdings displayed a somewhat different pattern, increasing dramatically prior to 1994–95 and then falling back to the low levels observed 10 and 20 years earlier. Much of this movement appears to reflect activities related to cross-border shopping, however, of both a legal and illegal nature.

The one area where dollarization has become more prevalent is as a store of value. Canadian households seem to be directing an ever-larger share of their portfolios to U.S.-dollar assets. Again, however, the relative importance of foreign investment in Canadian portfolios is often much lower than it is in other industrial countries. Moreover, most of the foreign investment activity that we have seen in the recent past can be credited to looser government restrictions. Standard portfolio models indicate that, by most measures, Canadians are still seriously underdiversified, and that more outward investment can be expected in the future.

Canadian corporations are also borrowing more extensively in U.S. dollars and in U.S. markets, but much of this has been at the expense of other foreign borrowing. The share of financing raised in domestic markets has remained essentially unchanged during the past 15 years. The same can be said of Canadian equity financing, where domestic markets have also managed to preserve and even increase their relative share through the late 1990s and early 2000s.

Critics of the present exchange rate system acknowledge that the current state of the Canadian dollar is not as dire as some had suggested, but they note that its future is far from assured. The world is becoming more polarized, they suggest, dominated by two or three key currencies. Small regional currencies, such as the Canadian dollar, will find it increasingly difficult to survive and will eventually be displaced by the euro, the U.S. dollar, and the yen or yuan.

Even if this were true, it is not obvious that the process would unfold as easily or as quickly as the critics believe. Past experience indicates that there are only two ways that a country can become dollarized. Its government can make an explicit decision to adopt another country's currency—official dollarization—or it can so mismanage its own economy that citizens opt for another

currency—unofficial dollarization. Unofficial dollarization has never been effected under a regime of sound macroeconomic management. In fact, the evidence tends to go in the other direction. Countries, it seems, must chronically mismanage their economies before households and firms show any indication of shifting to other currencies. The hysteretic effects associated with the use of a given currency are sizable. It is difficult to supplant the domestic currency; but, once replaced, it is difficult to resurrect.

Canada, unlike Argentina, has a reputation for solid macroeconomic performance. While no one would claim that it has been perfect, it has been at least as good as that of most other industrial countries—including the United States—and it is getting better over time. Inflation in Canada has typically been quite similar or slightly lower than that of the United States since the early 1990s. And with explicit inflation targets now in place, there is every reason to expect even better performance in the future. Although low and stable inflation is obviously of benefit in its own right, it also reduces the likelihood of unofficial dollarization.

The counter to this argument, as well as to past experience, is that Canada is special, and that dollarization remains a strong possibility. Old rules, therefore, will not necessarily apply. Canada enjoys a unique relationship with the United States, and has an unprecedented amount of trade and investment with its southern neighbour. These factors, the critics suggest, increase the likelihood of dollarization and override the lessons learned in other countries. While such an outcome is always possible, nothing that we have uncovered in the data points in this direction. Many of the recent trends actually move in the opposite direction and indicate that dollarization is less likely now than it was in the past. The best contribution that the Bank of Canada can make to the performance of the Canadian economy *and* to the longevity of the Canadian dollar is to maintain low and stable inflation.

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Appendix A
Short-Run Demand Equations for Currency and Broad Money

A.1 Introduction

This appendix describes empirical work that was undertaken using short-run money-demand equations to detect and measure the extent of dollarization in Canada.[1] The approach that was followed borrowed extensively from an earlier literature on currency substitution. The latter bears a close relationship to the present discussion of dollarization and was of considerable interest to monetary economists in the late 1970s and early 1980s.[2] For obvious reasons, it is now receiving renewed attention.

The first stage of the analysis involved estimating standard, closed-economy models for currency, together with a broad money measure, M2++, to test their stability over time. Evidence of structural instability in these standard equations would provide indirect support for the presence of dollarization, particularly if it was associated with a significant and unexplained decline in the demand for domestic money. The results would not be conclusive, of course, since other factors, such as financial innovation, might also have caused the instability.

The second stage of the analysis was designed to yield a more direct measure of dollarization. It involved adding variables to the original specification to capture the opportunity cost of investing in foreign currency and short-term money instruments. While problems of collinearity often make it difficult to obtain reliable estimates of the parameters on these extra variables, the existence of correctly signed and statistically significant coefficients would provide direct evidence of dollarization.

The rest of this appendix describes the specifications that were tested and the results that were obtained. Although some suggestion of currency substitution or dollarization was observed in the currency equation during the first half of the sample, the results, for the most part, were not very supportive of the dollarization hypothesis.

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1. We would like to thank Joseph Atta-Mensah, Andra Ghent, and Ramdane Djoudad for their assistance in completing this work.

2. See, for example, Boothe et al. (1985), Bordo and Choudri (1982), Cuddington (1983), and Feige et al. (2000). Currency substitution can be regarded as a modest or less-threatening form of dollarization, in which agents shift between domestic and foreign money balances in response to their respective rates of return and opportunity costs.

A.2 A Simple Error-Correction Model

The demand functions that we estimated are shown below. They are based on the simple, error-correction specification described in equation (1).

$$\Delta m_t = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta m_{t-i} + \sum_{i=0}^{n2} \alpha_{2i} \Delta y_{t-i} + \sum_{i=0}^{n3} \alpha_{3i} \Delta r_{t-i} \tag{1}$$
$$+ \lambda(m_{t-1} - \beta_0 - \beta_1 p_{t-1} - \beta_2 y_{t-1} - \beta_3 r_{t-1}) + u_t.$$

where m is the natural logarithm of the monetary aggregate (currency or M2++) deflated by the CPI, y is the natural logarithm of real GDP, r is the domestic opportunity cost holding money (the 90-day commercial paper rate in the currency equation and the 10-year government bond rate in the M2++ equation), Δ is the first-difference operator, and λ is the error-correction coefficient.

The equations were estimated with quarterly data, spanning the sample period 1961Q1–2001Q4 in the case of currency and 1968Q1–2001Q4 for M2++. As long as the non-stationary variables appearing in the equation were cointegrated, equation (1) could be estimated using a consistent estimation procedure. The lag lengths on the first-difference variables that were used to capture short-run dynamics were determined by assigning four lags to each variable and then "testing down." In most cases, only the first lag was significant.

A.3 Parameter Estimates for the Standard Equations

The parameter estimates for the two standard equations are shown in column 2 of Tables A1 and A2. All the coefficients are statistically significant and correctly signed. The implied long-run demand for currency is:

$$curr_t = -4.07 + 0.76y_t - 0.07r90_t, \tag{2}$$

and the corresponding equation for M2++ is

$$m2{+}{+}_t = -10.41 + 1.45y_t - 0.03rl_t. \tag{3}$$

Table A1: Money-Demand Equation for Currency: Parameter Estimates
Sample Period: 1961Q1–2001Q4

	Excluding the exchange rate	Including the exchange rate
adjustment	-0.017 (-2.185)	-0.029 (-3.227)
constant	-4.066 (-3.887)	-6.220 (-7.027)
RGDP[t-1]	0.761 (9.899)	0.964 (11.103)
R90[t-1]	-0.070 (-2.488)	-0,057 (-4.099)
exchrate[t-1]	æ	-0.616 (-2.832)
Δcurr[t-1]	0.404 (5.600)	0.340 (4.515)
Δrgdp[t-1]	-0.044 (-0.684)	-0.036 (-0.565)
ΔR90[t-1]	-0.001 (-2.028)	-0.001 (-1.490)
Δexchrate[t-1]	æ	0.014 (0.484)

Note: *t*-statistics in parentheses. Dependent variable is the first difference of the real currency outside banks. Δ indicates first difference.

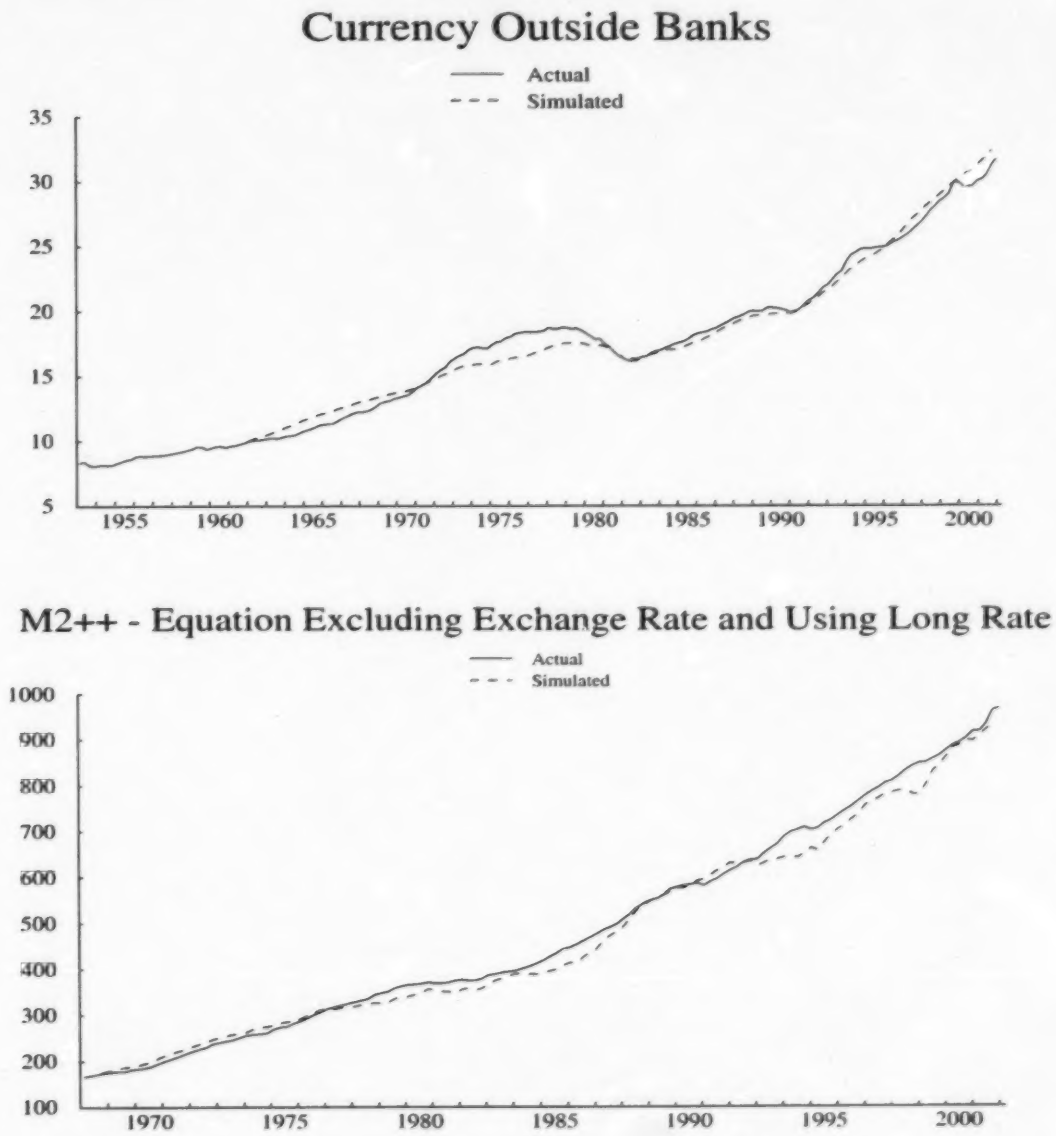
Table A2: Money-Demand Equation for M2++: Parameter Estimates
Sample Period: 1968Q1–2001Q4

	Excluding the exchange rate	Including the exchange rate
adjustment	-0.037 (-2.578)	-0.030 (-1.969)
constant	-10.406 (-6.511)	-8.938 (-2.374)
RGDP[t-1]	1.448 (13.481)	1.339 (4.691)
RL[t-1]	-0.031 (-2.638)	-0.038 (-2.039)
exchrate[t-1]	æ	0.106 (0.336)
Δm2++[t-1]	0.204 (2.186)	0.195 (2.081)
Δrgdp[t-1]	-0.049 (-0.614)	-0.054 (-0.660)
ΔRL[t-1]	-0.002 (-2.444)	-0.002 (-2.110)
Δexchrate[t-1]	æ	-0.049 (-1.518)

Note: *t*-statistics in parentheses. Dependent variable is the first difference of the real currency and real m2++. Δ indicates first difference.

As one would expect, the income elasticity in the currency equation is much smaller than that in the M2++ equation, while the semi-elasticity for the interest rate term is much larger. Both estimated equations are able to track the major movements in the actual data with reasonable accuracy (see Figure A1), and there are no evident signs of structural instability.

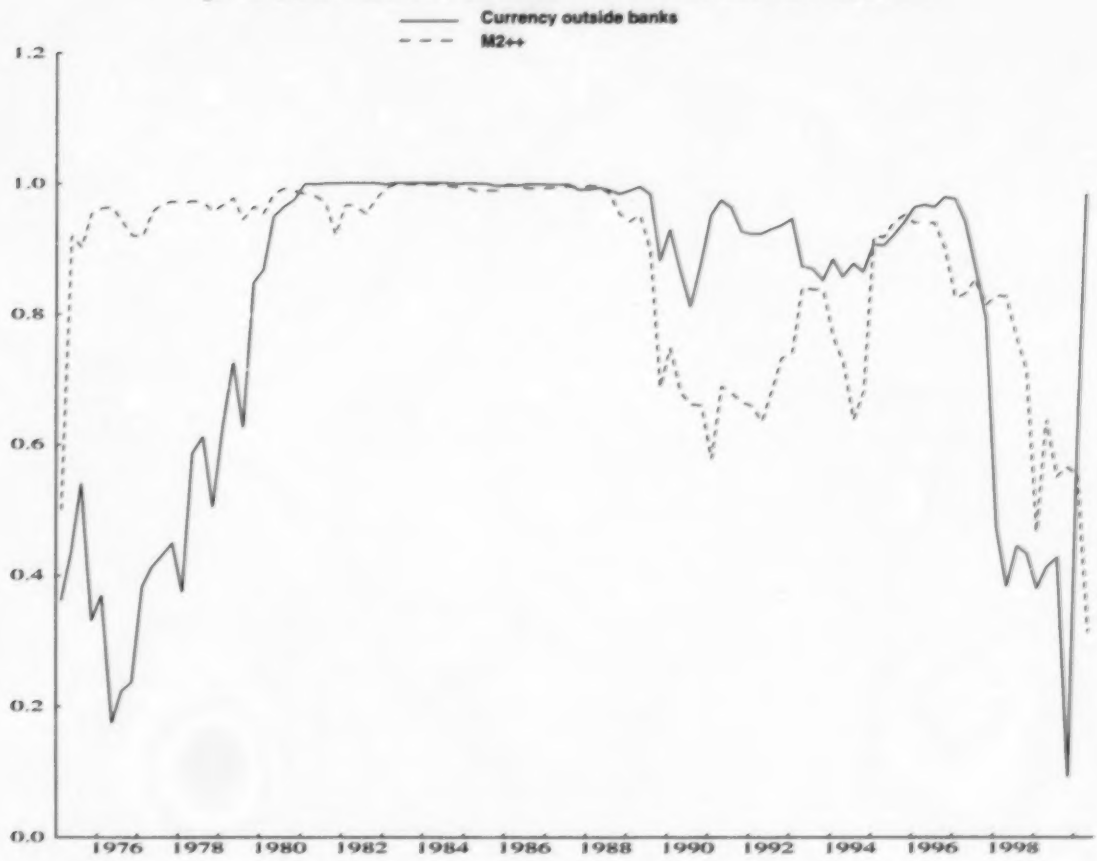
Figure A1: In-Sample Fit
(Can$ billions)



A.4 Testing for Structural Stability

Although the equations appear to be well behaved, rolling Chow tests were also used as a more rigorous check for structural instability. The resulting *p*-values are plotted in Figure A2. Although some movement is detected in the final estimates of the currency equation at either end of the sample, the *p*-values are typically higher than 0.1, indicating that the parameters are stable. Some variability is also observed in the plot for M2++, but the *p*-values are again greater than 0.1. In short, there is no reason to believe that the standard equations have undergone a major structural shift over the last 40 years because of dollarization or any other unsettling influence.

Figure A2: Rolling Chow Tests for the Money-Demand Functions



A.5 *Testing for Currency Substitution*

A more direct test of dollarization can be conducted by adding to each equation an extra variable that captures the opportunity cost of shifting funds out of the Canadian dollar and into U.S.-dollar assets. The best results, in terms of generating coefficients that were occasionally significant, were obtained by including the Can$/US$ exchange rate in both the cointegrating vector and as part of the short-run dynamics. Trying to add foreign interest rates to the equations proved ineffective, owing to severe collinearity, and it typically made both the domestic and foreign interest rate terms insignificant.

The final estimates are shown in column 3 of Tables A1 and A2. No evidence of currency substitution or dollarization was found in the case of M2++, but the exchange rate term in the currency equation was significant and correctly signed. Further testing indicated that all the significance was drawn from the first half of the sample, however, and that the exchange rate term lost all of its explanatory power once the sample was split in 1980 (Table A3).

Table A3: Money-Demand Equation for Currency with Exchange Rate Variable: Parameter Estimate Split Sample

	1961Q1–1980Q4	1981Q1–2001Q4
adjustment	-0.098 (-2.848)	-0.064 (-3.447)
constant	-6.319 (-9.128)	-4.680 (-2.484)
RGDP[t-1]	0.963 (16.581)	0.764 (5.653)
R90[t-1]	-0.024 (-2.475)	-0.034 (-3.373)
exchrate[t-1]	-0.836 (-4.602)	0.059 (0.426)
Δcurr[t-1]	0.183 (1.633)	0.236 (2.205)
Δrgdp[t-1]	-0.079 (-0.992)	-0.076 (-0.734)
ΔR90[t-1]	0.001 (0.824)	-0.001 (-1.165)
Δexchrate[t-1]	-0.056 (-0.901)	0.059 (1.681)

Note: *t*-statistics in parentheses. Dependent variable is the first difference of the real currency outside banks. Δ indicates first difference.

A.6 Conclusion

The parameter estimates and stability tests reported above provide little support for the notion that dollarization was or is an important feature of the Canadian economy. Some evidence of currency substitution was detected in the currency equation over the 1960–80 sample period, but its significance seemed to disappear rather than grow as the sample was extended.

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